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ROCKS AND MINERALS

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A Magazine for Mineralogists, Geologists and Collectors

JANUARY, 1947

35c

8th LIST OF FINE MINERALS

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ROCKS and MINERALS

PUBLISHED MONTHLY

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JANUARY 1947

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

WHY THE DECEMBER ISSUE WAS LATE!

The December, 1946, issue of *Rocks and Minerals* was mailed on Dec. 28—28 days late! We had hopes of mailing it around the 10th but our printers were held up due to paper shortage. The type was all set up but no paper! In desperation the printers contacted us in the hope we might be able to obtain a supply for the issue and though we contacted by phone a number of friends and acquaintances who were connected with paper companies not even one could help us. Finally the printers were able to obtain a supply—enough for the issue—but it was of low grade and the illustrations turned out poorly.

The printers tell us that the paper situation is worse now than it was during the war—the worst they have ever seen and they have been in business for many years. If this current January issue is late, and the February and March issues will be too, you will know why—our printers are still having great difficulty in obtaining paper for the magazine.

A SUBSCRIBER WHO REMEMBERS!

Editor R&M:

Enclosed find $3 for my renewal of *Rocks and Minerals*— truly the least money I can ever pay for the dividends it brings—each monthly visit is a pleasure to look forward to.

I have always regretted loaning out those early issues which of course were seldom or ever returned but as I think back you sure have been on the job keeping the magazine going especially through those first lean years and accomplished what you have set out to do. Through your untiring efforts, practically all the various state mineral societies have grown up and are now on their own. Really you must deserve a lot of satisfaction as the various mineral societies send in their reports of field trips and other activities in connection with mineral collecting bringing to light specimens from old deserted mines whose records had to be searched to find their location. You have been a kind of a daddy to it all, with your good old *Rocks and Minerals* as a guiding hand.

A few of us remember away back when there wasn't as much as a pamphlet published, or any information obtainable, regarding mineral collecting. The present day collector will never know what efforts we put in getting together those early collections. The few dealers were of little help in giving away any information; their lists of customers were locked in the strong box and—exchanges were practically unknown. Today members of the various mineral societies are scattered throughout the length and breadth of these United States—thanks to the ever untiring efforts of Peter Zodac, Editor of *Rocks and Minerals*.

Albert Everitt,
Escondido, Calif.
Dec, 12. 1946.

Editor's Note: Mr. Everitt became a subscriber for *Rocks and Minerals* on Jan. 17, 1927, and has never allowed his subscription to lapse. He is truly one of our dearest friends.

It may interest our new readers, and especially those who are amateur cutters, that it was *Rocks and Minerals* who printed in popular language, what we believe to be the first bit of information for amateurs, on the cutting and polishing of semi-precious stones. This information had been prepared by J. Harry Howard, 504 Crescent Ave., Greenville, S. C., was printed in pamphlet form under the title "The Working of Semi-Precious Stones," and came out on Wed. May 20, 1931. In the September, 1931, issue of *Rocks and Minerals*, we started the "Amateur Lapidary Department," with Mr. Howard, in charge and which he conducted for many years; this feature still appears in the magazine. Before Mr. Howard's pamphlet came out, there were only about a half dozen amateur cutters in the country—now you can count them by the thosuands! This pamphlet was the beginning of amateur cutting in America!

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A FURTHER STUDY OF THE TERMINAL MORAINE IN THE NEW YORK CITY AREA

BY MAURICE B. ROSALSKY

College of the City of New York

In his interesting and exceedingly thought-provoking article entitled, "A Visit to the Terminal Moraine in New York City," *Rocks and Minerals,* May 1946 pp. 272 to 273, Dr. C. H. Kindle suggests a number of new ideas concerning conditions in this area during and after glacial times. Writing about the terminal moraine along Hillside Avenue in Queens he says, "It is expected in general that morainal deposits are succeeded southward by an outwash plain of gravel, sand, and silt deposited by streams draining the melting glacier. But such a steep, straight border to the moraine is unusual and requires a special explanation."

The writer questions the special explanation offered in this paper. Dr. Kindle explains the straight steep escarpment of the terminal moraine by saying that the sea reached in over southern Long Island and eroded the southern border of the terminal moraine into the steep escarpment. It this were so, he points out, the broad flat expanse of southern Long Island would be more correctly termed an uplifted sea floor rather than an outwash plain. Since the base of the moraine at Hollis is about 60 feet above sea-level, he asserts that the sea-level at the time it eroded the escarpment was 60 feet higher than it is now in relation to the land. The writer questions the statements that sea-level was 60 feet higher than it is now at the time of formation of the escarpment and that this escarpment was bordered by an uplifted sea floor. Instead a picture is postulated in which sea-level was at the present day elevation at the time of formation of the marine cliff and that this cliff was bordered by a normal deltaic outwash plain.

What is the evidence in the first place in favor of this being a marine cliff? Dr. Kindle points out that the moraine terminates steeply and is straight for a considerable distance. Some other facts may be added to these. The "moraine" was found by M. L. Fuller[1] to consist mostly of stratified deposits of the Manhasset formation overlain by a thin mantle of till of late Wisconsin age. That is, the deposit consists of earlier glacial sediments covered by late glacial sediments. Everywhere the late glacial covers the earlier glacial sediment but only in one small area in the Brooklyn quadrangle (the Richmond Hill area) do we find an irregular front which consists of late glacial material alone.

Can this situation be explained on the basis of a normal terminal moraine? If so, we should have to affirm that the earlier glaciation deposited a moraine here and that the later glaciation deposited a second moraine exactly over the first one covering it everywhere and not going beyond it except at the Richmond Hill area. Such a coincidence is improbable in the highest degree. On the other hand if a marine cliff was formed in the deposits of the earlier glaciation it would have a steep straight escarpment. Now if this area were overridden slightly by the ice of the later glaciation, wave action would remove the fresh glacial deposits placed beyond the escarpment but leave those

deposits on top of the escarpment. Thus one moraine would directly overlie the other. The Richmond Hill area with its late glacial deposits lying to the south beyond the straight cliff would be explained as a large deposit from a lobe which moved well beyond the cliff line. So much moraine was dumped here that wave action could not remove it.

Let us now construct an ideal picture of conditions along the marine cliff during glacial times. Then let us see if the facts affirm or deny this picture.

We will start with the deposition of an outwash plain of the earlier or Manhasset glaciation. Somewhat after this the sea reached this area, cut into the outwash and formed a straight steep marine cliff in it similar to the cliffs now forming on the north shore of Long Island. Streams flowing south to the sea formed valleys in these earlier glacial deposits which were represented by notches when the valley reached the sea at the marine cliff. The streams, amply supplied from the poorly consolidated sediment, started depositing deltaic outwash plains in the sea. As they grew, the fanlike deposits connected up with adjacent fans. The outer margins of the fans were at sea-level but at the apex the elevation was naturally much higher. Moreover the apex of the fan at the base of the cliff was higher in elevation than those portions of the fan away from the apex also bordering the cliff. The elevations at the base of the cliff would slope systematically away from the apex of each fan. Then the ice of the later Wisconsin glaciation covered the area depositing till over the earlier glacial deposits both on the general high level surface and in the valleys cut in these earlier deposits. The prior discussion explained why only rarely are the late glacial deposits found south of the earlier. Finally in recent times streams partially cut up the fans making less obvious the arcuate pattern of their contours.

Does the critical evidence shown by the area favor this theory or that propounded by Dr. C. H. Kindle? According to the theory of a former higher sea-level, the base of the cliff should everywhere be at the same level, for example everywhere 60 feet above sea-level as cited in the Hollis area. A study of the escarpment in the Brooklyn, Hempstead, and Oyster Bay quadrangles shows that this is not the case, for the elevation of the base of the escarpment rises from about 60 feet above sea-level in the Hollis area to about 200 feet above sea-level in the Roslyn area. But if the deposits at the base of the escarpment were fanlike in character, as discussed in the ideal picture, our difficulties disappear for we would then expect a sloping base to the escarpment. The apex of the fan should be found where the base of the escarpment is highest. This condition is met in the Roslyn area. At such a place there should be an important through valley which supplies outwash to the fan. A valley just east of Harbor Hill in the Roslyn area seems to meet these conditions. From this point west, the base of the escarpment slopes down systematically as we should expect it to do with increasing distance from the apex of the fan. This systematic relationship disallows the possibility that we are here dealing with a warped shoreline.

If we are dealing with a fan type of deposit, its outer margin at sea-level should be arcuate in pattern. A study of this area reveals the presence of fanlike forms typical of deltaic outwash plains. Such forms can be seen for example at Christian Hook in the Hempstead quadrangle and in the Strongs Point and Conklin Point areas in the Babylon quadrangle. If subsequently sea-level rose 60 feet to erode the base of the escarpment it would doubtless have cut to pieces the poorly consolidated fans leaving no trace of the arcuate pattern on our present day maps. Close observation of all the aforementioned quadrangles shows an arcuate pattern of contours, a feature to be expected in a deltaic outwash plain. Of course the south flowing

streams have cut into the poorly consolidated rocks causing so many reentrants in the arcuate pattern that the pattern is somewhat masked.

We are therefore left with the following picture. *One* The deposition of the Manhasset outwash. *Two* The cutting into it of a wave-cut cliff at present sea-level prior to the deposition of the Wisconsin till. *Three* The building up of a deltaic outwash plain mostly prior to the deposition of the Wisconsin till to the extent that the fan apexes were about 200 feet above sea-level. *Four* The deposition of the Wisconsin till burying both the upper level and valleys in the escarpment by a thin veneer up to 30 feet thick, *Five* A recent minor erosion of the deltaic outwash plain by small south flowing streams.

Thus it would appear to be clear that the sea at the present level was competent to form the straight escarpment without the necessity of a former 60 foot rise.

The problem could be approached from another angle. Dr. H. L. Fairchild[2] has shown that post-glacial uplift has caused the land to rise from 0 feet slightly south of the New York City area to over 700 feet above sea-level at the Canadian border. This is attributed to the weight of glacial ice causing a temporary subsidence of the earth's crust. With the disappearance of the ice the land has rebounded more in the north than in the south because the northern area had been weighted down by a greater thickness of ice. Dr. Kindle attempts to correlate the base of the terminal moraine at Hollis with the top of the Croton delta at Harmon both of which are *now* at an elevation of 60 feet above sea-level. He says that both these features were formed in glacial time when sea-level was 60 feet higher than it is now in relation to the land. Dr. Fairchild's map shows that the Croton delta area which is thirty miles to the north of the moraine had upon the melting of the ice deformed upward at least fifty feet in relation to the New York City area. This is confirmed by Dr. H. B. Kummel's[3] study of the post glacial warping of the shoreline of former glacial lake Passaic, which since glacial times has had its north end upwarped 67 feet in relation to the south end in a distance of thirty miles. So if at any time there was a correlation between sea-level at the top of the Croton delta and sea-level at the base of the moraine, there should be at least a 50 foot difference in elevation now as the result of post-glacial warping.

Thus a present correlation between the top of the Croton delta and the bottom of the moraine in Queens has no relation to the conditions in glacial time and can not be used as proof of a general 60 foot rise in sea-level during glacial time.

In fact there is some evidence that the area around Croton delta instead of being connected with the sea in glacial times was actually a freshwater glacial lake. Dr. C. A. Reeds[4] writes that the stratified sands at Croton Point, Harmon, and Peekskill are very thick and are found at elevations up to 100 feet above the present sea-level, the approximate position of the shoreline of a possible glacial Lake Hudson at these places. He believes that they represent delta deposits made in the lake. Underlying varves help confirm this. Of course if this were a lake, no correlation with a possible sea-level has any meaning.

Dr. Kindle notes that pot-holes eroded out by rocks in subglacial streams are found down to and below present sea-level in northern Manhattan. He suggests two possible explanations both connected with the assumed correlation of the top of the Croton delta and the bottom of the moraine in Queens. *First Explanation* The pot-holes were cut at an early stage in the glacial advance before the glacier had been present a sufficient length of time to cause the region to sink. *Second Explanation* The pot-holes were cut at a late stage in glaciation with the sea-level rising relative to the land after the ice had left the region. Of course

either of these theories depends upon the prior assumption that sea-level was 60 feet higher than it is now. If the discussion in this paper, which showed that there was no necessity for sea-level in the New York City area being any higher in glacial time than now is correct, the need for either of the above two theories disappears. A pot-hole which now extends slightly below sea-level as the one cut in hornblende schist in Inwood Hill Park could be explained by a very minor recent rise in sea-level.

If now we look back over the whole problem we see how all the facts appear to fit nicely into the interpretation that the sea at its present level formed this great inland scarp of western Long Island during pre-Wisconsin time and that the escarpment was bordered by a normal deltaic outwash plain. The picture presented does not have any necessary conflict with various possible rises and falls of sea-level at other times during the last glaciation.

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3 Henry B. Kummel 'Glacial History of the Passaic Valley and Related Geologic Features." International Geological Congress XVI session U. S. Guidebook 9, 1933

4 Chester A. Reeds "The Varved Clays and Other Glacial Features in the Vicinity of New York City." International Geological Congress XVI session U. S. Guidebook 9, 1933

Ancient Buried City donated to Hospital

The Ancient Buried City located in Wickliffe, Ky., and which was discovered in 1932 by Col. Fain White King, a member of the R&MA, has been donated to the Western Kentucky Baptist Hospital. The City is located on a 25-acre tract, on U. S. Routes 60, 62, and 51, where the Ohio River empties into the Mississippi; it was widely visited by tourists. The Baptists plan to continue catering to tourists and in addition will build cabins, an assembly room, and a chapel to make the area an encampment ground for Baptists of Western Kentucky.

An interesting write-up about the gift appeared in the *Courier-Journal* (Louisville, Ky.) in the issue of Nov. 24, 1946.

In his letter of Dec. 10, 1946, to the Editor of *Rocks and Minerals* Col. King writes—"I have just finished giving away the Ancient Buried City and this week sent in my resignation to the Governor of Kentucky as State Archaeologist, also resigned from the executive board of the Kentucky Lake Assn.—Now I can do some of the things I have wanted to do for years. "play with minerals."—Mrs. King and I are leaving in a couple of days for the West to be away for a month or longer, to visit friends, mines and dealers——."

LAPIDARY EQUIPMENT CO. TESTING NEW POWER FEED

According to K. J. Hillquist of the Lapidary Equipment Co. in Seattle, the company has been testing for the past thirty days a revolutionary type of power feed for use on their H-16V Diamond Saw Unit.

"Unlike any other feeding device now on the market," says Mr. Hillquist, "this new power feed will *automatically* adapt itself to the varying hardness of the rock being cut. The exclusive mechanical principles involved quarantee a perfectly smooth cut at the highest rate of speed that the saw will handle. Maximum life is thus obtained from the saw blade because it is never subjected to undue pressure which would glaze the edge or strip the set."

This new automatic power feed can be installed quickly and easily on any of the H-16V Diamond Saw Units now in use.

While shortage of materials makes full scale manufacture of this new item difficult, they expect to be in production shortly and will announce prices and delivery through the pages of this magazine.

Also in the testing stage with the Lapidary Equipment Company is a new high speed cut-off and trimming saw said to posssess many advantages. Details will be released by the company as soon as the equipment has undergone a prolonged test to which it is now being subjected.

A RECENT FORMATION OF CALCITE IN AN ABANDONED MINE

BY ALBERT L. KIDWELL, Geologist
Missouri Geological Survey and Water Resources

An interesting deposit of recent calcium carbonate or calcite was found during the examination of an abandoned mine in the Valle Mines District of southeastern Missouri in May, 1946. The old shaft was entered by bucket and windless by Messrs. Otley Bishop and Homer Bollinger of the U. S. Bureau of Mines; Mr. Henry Kelly, an old miner of the district; and the writer. The examination was conducted to ascertain the mode of occurrence of the ore which had been mined here.

The old mine is known locally as the Bill Mine and is located on the north side of the main Valle Mine District. It is about a mile and a half southwest of Valle Mines Post Office, which in turn is approximately forty miles south of St. Louis. The district has been mined intermittently for lead, zinc, and barite since 1824. At present the old dumps are being milled for zinc carbonate and galena.

The Little Bill Shaft, which was the one entered, is 95 feet deep and in good condition. Mining was carried on by drifting along joints and solution channels which contained the galena, barite, and smithsonite in red tallow clay. The drifts vary in height from 3 to 10 feet and in width from 5 to 10 feet. The country rock is the lower part of the Eminence dolomite which is upper Cambrian in age.

The calcite was found at two places in the mine, near the shaft and about 200 feet to the southwest. The mine is dry except for these two places where water drips from joints in the back. The calcite at both places occurs in stalactites up to two inches long on the roof, as a thin crust on the wall, and in botryoidal masses from one-half inch to one inch thick on clay and waste rock which was left piled in the drift. In addition the calcite occurs for a distance of two or three inches into the muck as cavity fillings and along shrinkage cracks.

The botryoidal growths are most unusual in that they have not been formed under water as is commonly thought necessary. Some of these were found as much as two feet above the floor on piles of muck that could not have been under water because the mine is drained naturally through joints and channels in the Eminence country rock.

Deposition probably was initiated upon a rough pile of clay and small rock particles. The first solutions were absorbed by this porous mass and the first calcite was deposited in the available openings. As the process continued, a thin film was laid down over the rough surface which was gradually built up by the formation of tiny columns radiating at right angles from the surface on which they were deposited. As the space between these columns was filled in, other crystals were formed on top of them. This process is well illustrated by some of the specimens collected which show these columns with the space between them unfilled. The columns are usually wedged-shaped but occasionally consist of tiny balls supported by a smaller pedestal. The botryoidal masses exhibit a rough, concentrically banded structure. An attempt was made to count the bands, but the definition was too poor.

The calcite has definitely been formed since the mine was abandoned. The exact date of abandonment is not known; but, according to old residents of the area, it was probably some time between 1850 and 1870. We may assume then that it has taken at least eighty years to deposit an average of less than one inch of botryoidal calcite and a two inch growth of stalactites.

PHOSPHORITE FROM THE SEA FLOOR

BY K. O. EMERY
Geology Department, University of Southern California

One of the more difficult but very interesting ways of doing geological work is from ship-board. During the last ten years a great number of studies of the sea floor have been made by especially equipped ships which carry echo sounding devices to investigate topography and various types of sampling gear to collect samples of the bottom. A large number of rock samples have been obtained, especially off southern California. One of the most interesting of the rocks found there is phosphorite, which was included in about forty-five out of one hundred forty dredgings at depths between 240 and 8400 feet.[1]

The sea floor off southern California consists of a checkerboard-like series of banks and basins, somewhat like the basin and range physiographic province of Nevada. Many of the banks rise as much as 6000 feet above the bottoms of adjacent basins to within 300 feet of sea level. Some of these submerged mountains even extend above sea level as islands. Dredging showed that the flat tops of most of the submerged banks are partly covered by phosphorite. Dredgings made farther north off Monterey Bay and farther south in the Gulf of California also disclosed the presence of phosphorite. Examination of records of earlier work by other expeditions revealed that this rock had been obtained from the sea floor in many other parts of the world. Indeed, it appears to be far more common on the sea floor than on land, although it is known and mined in Idaho, Wyoming, Kentucky, and Florida as well as in foreign countries. In spite of its presence in many land areas, phosphorite is not generally recognized by many collectors.

Phosphorite dredged from the sea floor occurs in dense brown nodules which vary in size from minute pellets to large masses weighing as much as 160 pounds. They are irregular and variable in shape. Most of the larger pieces are slabs with upper surfaces covered with protuberances and relatively flat under surfaces. Their exposed top surface is generally glazed and partly discolored by a thin black coating of manganese oxide. It is sometimes covered by an abundant growth of attached organisms such as bryozoa, corals, brachypods, and algae (Figure 1). The buried bottom surface of the nodules is light brown and is separated by a sharp line of color change from the darker top surface. The sediment in which the nodules are embedded consists mostly of the test of Foraminifera and grains of glauconite. The assemblage of phosphorite, glauconite, and foraminiferal tests is characteristic of the tops of banks and of some other areas of very slow sediment deposition.

According to chemical analyses the average composition of the phosphorite is 30 per cent phosphorus oxide, 45 per cent calcium oxide, and 3 per fluorine. The remainder consists of a variety of other elements present partly as impurities. The composition is such that the phosphorite might be mined for fertilizer if present in abundance on land instead of lying at the bottom of the ocean where it is difficult to reach.

Examination of petrographic thin-sections indicate that the principal mineral form of the phosphate is collophane, or amorphous tri-calcium phosphate. Polished sections show a range of textures between pieces which are composed of almost pure massive collophane to pieces in which collophane acts as a cementing material between phosphatic oolites, worm castings, pebbles, clastic mineral grains, foraminiferal tests, and remains of other animals. Fish bones, shark's teeth, a whale's earbone (Figure 2), and a bone of an extinct species of sea lion have been found in or associated with the phosphorite. The polished sec-

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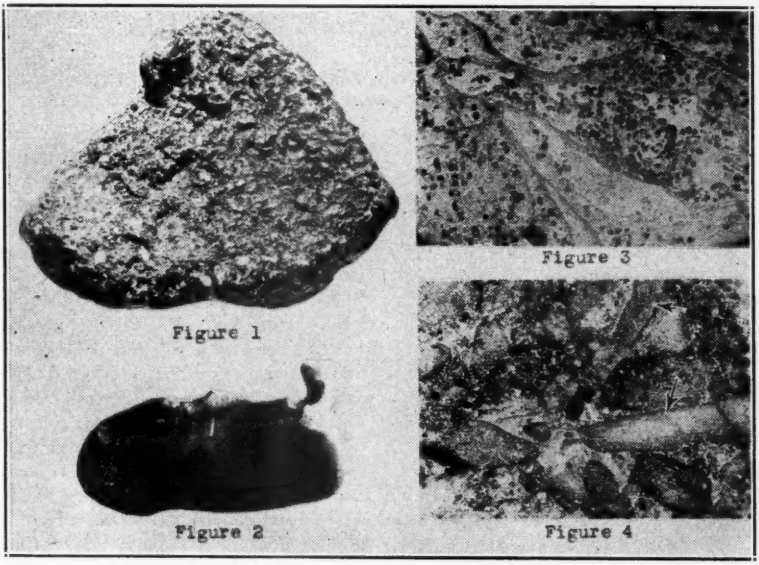

Figure 1

Figure 2

Figure 3

Figure 4

Figure 1. Large phosphorite nodule covered by abundant encrusting organisms. X ¼

Figure 2. Whale's earbone dredged with phosphorite. X 1

Figure 3. Polished section of phosphorite showing oolites, mineral grains, and irregular layers indicating discontinuous periods of accretion. X 2½

Figure 4. Polished section of phosphorite showing enclosed small nodules and rock fragments. Arrows point to animal borings which have became filled with later phosphorite. X 3½

tions usually display numerous irregular layers representing many different periods of accretion (Figure 3). These layers differ from one another in the abundance of grains cemented into the rock and in color. Between each period of growth the rock surface apparently became glazed, stained with manganese oxide, and covered by a thin layer of glauconite and foraminiferal tests. Some of the specimens contain holes drilled by boring worms and molluscs, and some of these holes are partly filled by new phosphorite (Figure 4).

Since the phosphorite is hard, dense, and takes an excellent polish it is very suitable for book ends, paper weights, and other ornamental objects. The presence of irregular structural layers, varicolored pebbles, and both large and small fossils within the rock add to its interest. If more amateur collectors and rock cutters learn to recognize it, phosphorite will probably be found more commonly. Since phosphorite seems to be forming on the sea floor even at the present time, it is perhaps most likely to occur in Recent or Cenezoic marine sediments near the coasts; however, it is known in some marine sediments of all ages.

ATTENTION EX-SERVICE MEN!

We would be pleased to receive notes or articles from you on minerals you may have found in foreign lands and especially if those areas are little known for minerals.

BUILDING STONE IN COSTA RICA

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 18)

Several kinds of stone that might be utilized for building as well as ornamental purposes are found in Costa Rica.

Marble of light-gray color with darker light-gray jaspers is found in Patarra. Its texture seems to be fairly compact. Annual output is estimated at 50 tons, and there is no exportable surplus. Production could be increased to supply an export market, depending on demand. Along "San Miguel Formation" south of San Jose, small quantities of a blue, lusterless marble are being extracted for experimental purposes. Although the predominant varieties of the material in the Turrialba quarry are light yellowish-gray and darker gray, spotted with various tones of gray, it is claimed that reddish-ivory blocks also have been quarried from this area. Its texture appears to be less compact than that of the Patarra region. The annual production at this quarry is about 100 tons. If demand were enough, the producer would be in an advantageous position to export the material because of the quarry's proximity to a railroad.

In addition to the above-mentioned quarries in Turrialba and Patarra, large deposits of marble are found in the western section of the Peninsula de Nicoya. This material is pink and red, usually spotted with ivory or black. Blocks of green marble have been found in the Peninsula de Osa along with ivory and gray varieties. No white marble has been found in the country.

Deposits of the material described in the foregoing are believed to be enough for exploitation purposes on a larger scale. However, the quality of marble that may be found below certain depths will be unknown until the deposits are explored completely, as only small excavations have been made to date. In general, Costa Rica marble does not seem homogenous, compared with that extracted from Italian quarries, for instance, but the large size of the deposits compensates for the loss of unsuitable material that has to be discarded or chipped out of good material. At present, marble is used locally for ornamental objects only and not as building blocks.

Artificial marble, locally designated as Terrazzo, is used in Costa Rica on a more extensive scale than marble. The material is made from ground marble and white or colored cement. Its surface, when highly polished, resembles that of marble. It is employed principally in tombstones, stairways, statues, and novelties.

Deposits of diorite closely resembling granite occur immediately south of San Jose and extend to the southeast regions as far as Pico Blanco on the Panamanian frontier. The best-known deposits in that section are in Salitral de Santa Ana, Cordillera de Talmanca, San Isidro del General, and Cruz del Obispo. This rock is believed to have more decorative value and higher weather resistance than marble.

Metamorphic rocks also are found in the above-indicated sections of the country. They offer a greater variety of colors than diorite, and are somewhat softer and therefore easier to handle.

Sandstone.—As this is a still softer type of rock, it is now used locally in construction work. It also offers a greater variety of colors as well as high weather resistance. As it has a more definite cleavage than diorite or metamorphic rocks, it is easier to quarry and cut.

Marble and sandstone are quarried on a small scale. The granitic rocks have not yet been exploited, for several reasons, including lack of adequate machinery for quarrying and fabricating, lack of transportation facilities, small demand, and lack of capital.

(Embassy Clerk Mario Chacon H., San Jose.)

SOME LOST MINERAL LOCALITIES OF NEW ENGLAND

II. Holland St. Quarry, Somerville, Mass.

BY PROF. CHARLES PALACHE

Cambridge, Mass.

For a number of years there was a road-metal quarry operated in Somerville in the gore where Holland St. and Broadway meet about half a mile north of Davis Square. The site of the quarry is now occupied by a school house and all evidence of its existence has vanished; but during its life it became the focus of much interest to local mineralogists by reason of the titanium minerals found there. The rock quarried was diabase from a dike intruded into the local slate. The face of the small pit was often crisscrossed by a multitude of veins of no great size filled with quartz and calcite. The quartz coated the walls of the veins, the rough and poorly formed crystals projecting into what had been open spaces, later to be solidly filled by coarsely crystallized calcite. I never saw an open cavity but the cleavages of calcite, often an inch or two across, showed beautifully a complex of pressure twinning, often so perfect that partings along the twinning planes truncated the edges of the true cleavage.

In order to obtain fair specimens of the quartz of some of these veins I etched out the calcite; the results as far as quartz was concerned were always disappointing but on one occassion I found on the surface of the exposed quartz crystals tiny yellow or orange crystals which under the binoculars proved to be excellent octahedroids of anatase, the oxide of titanium. This of course gave the specimens a wholly new interest; and I began collecting quantities of the vein material to try and find larger or different crystals. It soon appeared that they were to be found only in the narrower veins of about a half-inch or less in section; I found that I could often see crystals of anatase on the cross sections of veins, with the hand lens so there was more or less selection of promising material possible. My only means of transport was a bicycle with platforms rigged fore and aft. With this I traversed the two-mile route countless times and I dare say I lugged in a ton or more of the vein material. Finally one day when a blast had laid bare an unusual abundance of veins I hired a truck and stored another ton of the vein-containing blocks of diabase in the basement of the Museum. I bought commercial hydrochloric acid by the carboy and for many months there was a continuous succession of batches of calcite fizzing away in large jars of acid. Perhaps one out of twenty of the veins would show really good anatase crystals strewn more or less thickly on the white quartz walls. Once in a while a really fine piece would come to light; then I began to find plates of brookite, sometimes fresh and transparent brown, more often changed into aggregates of rutile needles of endless variety; occasionally too there would be a sphene crystal, perfectly white and with distinctive adamantine lustre. A few sulphide minerals came to light too, notably chalcopyrite and sphalerite, in rare crystals.

I surmised that the source of the titanium in these minerals was the ilmenite of the diabase and therefore sought out other veins in a similar geological setting. Such I found notably in the Mystic Quarries, two miles to the east, and in a very few of the calcite veins there found the same association of brookite of very fine quality and anatase of a blue color and more complex crystal form. I found them once again in veins in field stone from an unknown locality. So the Holland St. Quarry yielded a real harvest of scientific interest. In the crystal study of the tiny anatase crystals I was able to establish a few twin crystals, up to that time unknown in this widespread

(Continued on page 35)

"PAUL BUNYAN'S WOODPILE"

A Basaltic Formation in Utah

One of the many interesting geological formations for which the State of Utah is famous is "Paul Bunyan's Woodpile." This basalt outcrop is located near Jericho in western Utah.

How to find it

This interesting formation is 2½ miles almost due east of Jericho in eastern Juab County. Jericho is merely a station on the railroad, a flag station—no agent, no operator; it is also on U. S. Highway 6, the first station north of Lynndyl.

To reach the basalt locality, turn right off Route 6, just north of Jericho, the objective is the mountain to the east, in plain sight for most of the way, with a large sharp ledge on it. Head for it. Go just to the west of the mountain. There are several heep wagon roads but the best one is just north of Jericho, before coming to the abandoned CCC camp. The road is negotiable to a truck but it has some high centers that are much too high for the ordinary car. Road goes to within ¾ mile of the mountain. The basalt formation is on the saddle, at the head of the valley; this valley is borded on the east by the mountain with the sharp ledges on it.

A large CCC camp was located at Jericho when that organization was operative; it is now abandoned but a rock monument marks the spot on the road. The turnoff point to "Paul Bunyan's Woodpile" is not over ½ mile south of the monument.

"Paul Bunyan's Woodpile"

The top of the hill (in the saddle) is surmounted by three piles of basaltic lava, laid in horizontal rows, precisely like cordwood piled in nice neat rows, the ends even, each one fitting snugly against its neighbor, looking much as if it had been rough-adzed to keep any log from rolling.

The height of the "woodpile" is between 60 and 100 feet, and length about 350 feet. As looked at face-on, the appearance is that of a honeycomb, so dextrously laid is it.

This photo shows the corded effect, of short lengths of "logs." piled like the winter's supply of stove wood near the kitchen door, as was the custom in forested areas in the early days—all orderly laid and neatly arranged in three great piles for the wife to use in the kitchen stove—hence the name, "Paul Bunyan's Woodpile."

(Cut loaned by Mr. Frank Beckwith)

The legend of Paul Bunyan

Mr. Frank Beckwith, Editor of *Millard County Chronicle* (Delta, Utah), to whom credit is due for this article, gives us this information. "Paul Bunyan is a legendary character created in the logging districts of Minnesota and thereabouts whose fame extended throughout the West and even northward into British Columbia (Canada). Paul Bunyan was the hero of the workmen upon whom all mighty acts were fastened; he could cut more timber, of larger trees, than any man alive; he could do the impossible; he was the greatest figure on earth!

"Between breakfast and lunch, Paul made the Niagara Falls! He took a mighty timber in his mighty hands, drew it along the earth and its butt cut a furrow, water ran in and, lo and behold!—the Mississippi River! He played in the Yellowstone National Park with water and fire, and look what he made! He took two weeks off and dug the mighty chasm of the Colorado River!

"So mighty was he that he used 100 foot spruce trees for toothpicks!

"The furore of Paul Bunyan stories ran in Eastern magazines a decade or so ago—justs yarns but mighty ones—all of them outlandish and all of them about a hero of great fame. If a logger got to bragging, some one would chip in with a Paul Bunyan story and thus far outdo the braggert. His fame rose. Nothing that he couldn't do, and in the various yarns, did do.

Whenever anyone was "telling a tall tale," all a listener had to do to quell the talker was to say "Paul Bunyan." It took the wind out of the sails of the prevaricator pronto and labeled the yarn he was spinning. Paul was THE STUFF. None bigger, none mightier, none his equal.

"So, when the people of the mining camp of Eureka, Utah, wanted to give a proper name to the immense "woodpile" of columnar basalt 2½ miles east of Jericho, they naturally connected the legendary Paul Bunyan with it and named it "Paul Bunyan's Woodpile," in keeping with this imaginary heroic character who could, following a tiff with his wife, pile up enough wood to last a million years. It was no trouble for him to do it—why just a chore before breakfast—a mere matter

(Continued on page 15)

A close-up view, face-on, showing the ends of the lava "cordwood". For scale as to size, the man is standing in the opening so that comparative size may be gained.

The "wood" is mostly hexagonal in shape, though some pieces are five-sided, and a few seven-sided. Each piece closely fits its neighbor, just like a honeycomb.

(Cut loaned by Mr. Frank Beckwith)

"IN THE BEGINNING—"

BY MARIE E. RILEY

"How did you get started rock hunting? How did you know what to look for? How did you know where to look?"

Probably these are the questions most frequently asked my husband and me since we became Rockhounds. Thinking there might be many people wanting to know how to get started on this fascinating hobby, this is how we did it.

About seven years ago we were in Portland, Oregon, on a business trip, and in calling on a customer that had also become a good friend, we saw on his desk a stone, about the size of an egg, that even to us, ignorant as we were, was quite out of the ordinary. Business completed, my husband picked up the stone and asked our friend what it was and from where it came. He seemed quite surprised that we didn't know, but told us it was a banded agate, and had been found at Agate Beach, Oregon, on the Pacific coast, several years ago, when he and his wife had been vacationing there. More questions followed, and since we were going to San Francisco, we decided to go the coast route and have a look at this beach.

We were fortunate in our choice of a motor court at Newport Beach, which is adjacent to Agate Beach, at which to stay, as the couple that managed it were also rock hunters and members of the Agate Society of Newport Beach. When we inquired of them where to look, and admitted that it was our first attempt, they took us under their wings, as new converts, and showed us their collection, including an enhydro, that completely fascinated us. We had wondered what sort of a container we would use to hold our stones while collecting, and they told us a salt sack would be ideal. So clad in bathing suits, sweaters and beach shoes, and with our little salt sacks we hurried down to the beach.

I don't remember who found the first Agate, but it didn't take us long to find out that anything as big as the one seen on our Portland friend's desk was conspicous by its absence. We were thrilled at all the beautiful stones, which we later learned were Jasper, Petrified wood and Agates, and passed up nothing we thought might be worth while, even though many were pea-size and one as large as a marble was a FIND. We forgot the ocean and the rising tide and before we knew it, a big wave had sneaked up on us, when our backs were turned, and drenched us. The air off the water was cold, but no matter, we were rock hunters. When the tide had risen so that we could no longer ignore it, we went back to the cottage where we excitedly poured out our treasure before the lady of the court.

She was kind, but firm, and when she got through separating the good from the bad, we found we didn't have much left. Still being kind, she suggested that we take what was left to the young man that ran the agate and gem shop on the highway and let him pa s further judgment.

We quickly grabbed a bite to eat, as all that stooping and the fresh salt air had given us enormous appetites, then up we went to the Yaquina Gem Shop. Mr. Harold Prince was the owner and a fine young man he was. (Incidentally, we hear he is back at his old stand after having spent several years with Uncle Sam's Armed Forces.) He looked at our stones, rejected some more of them, but wonder of wonders, picked out a half dozen which he said were pretty good and offered to spot polish them for us. Two of the stones had well shaped inclusions, and these he made into cabochons for us. That did it! Once we saw what could be done, we were lost. To us, these two cabochons are still the prize of what has now become quite a large collection.

Mr. Prince told us of the Bend country in Oregon and of his bout with tick fever when hunting there. He told us of other beaches along the Pacific,

of books we could read on the subject, one of which was "Quartz Family Minerals" by Dake, Fleener and Wilson, and best of all, showed us the machinery he used for cutting and polishing, and also the finished gems in his show case. Being on business, we had to move on, but the germ had been planted and while working in San Francisco and Los Angeles it grew and grew until we just had to try our hand once more at rock hunting before leaving the Pacific. We were going to spend a week end in San Diego, so there was our chance to go again to the beach.

We got up early, packed our lunch, donned bathing suits and sweaters again, and with sugar sacks this time, set out for the beach. We were convinced that having found agates on the Oregon coast, there must be still more on the California coast, having some kind of a hazy idea that since that was south of Oregon, they must naturally gravitate in that direction. Arriving at the beach, we hurried out to the water's edge and there they were. A lot of clear shining stones, about the size of walnuts. Enhydros, no doubt. We were elated. It was a cloudy day, the wind was cold, but we picked up sack full after sack full and put them in a box in the car, all the time congratulating ourselves that no one else had thought to look there.

Along about noon I noticed my husband's legs beginning to look pink and asked him if they were hot. We couldn't think he might be getting sunburned as the sun wasn't shining. He decided they were all right, so about mid-afternoon, have filled our box, we went back to the cottage. Then he found the pink of his legs had turned a firey red and he had one of the worst cases of salt burn I have ever seen. After an almost sleepless night, we started the next morning for El Paso, Texas. The less said about that trip across the desert in summer, with sun blistered legs, the better. The stones that had looked so beautifully shining and clear when wet on the beach were now dull and plainly, even to us, nothing but quartz pebbles. Never the less, we took them along and some day shall use them in the bottom of a lily pool at our country home near Sprinfield, Ohio. It took two weeks for the blistered legs to heal, but in spite of our chagrin and discomfort, we knew we had found our hobby.

Fluorescent Concrete from New Jersey

An interesting specimen has been sent to the offices of *Rocks and Minerals* by Mr. Merton McKown, of South Ozone Park, N. Y. It is a 3x4 inch piece of concrete which under the Mineralight fluoresces red (many large dots and small massess) and green (many tiny dots).

A note from Mr. McKown states: "Concrete specimen was found 4 miles north of Franklin, N. J., by design and accident; first piece was picked up as a souvenir. I have adopted a policy of testing every specimen that I get with U. V. light and in this way have acquired several fluorescent specimens that were unknown, as for example, calcite in tremolite from Ducktown, Tenn. The concrete specimen was found along an old road. I call it "railroadite"—green to go ahead and red to stop and wonder."

The red fluorescence in the concrete is due to calcite and the green to willemite, the two most common fluorescent minerals at Franklin.

PAUL BUNYAN'S WOODPILE

(Continued from page 13)

of heating the earth, piling up a few million tons of lava "Logs," and then —to flapjacks."

(Mr. Beckwith visited the basalt locality and a most interesting write-up on the trip appeared in the July 4, 1946, issue of *Millard County Chronicle*).

COLLECTING NEAR TURRET, COLORADO

BY GUY B. ELLERMEIER

Few localities in Colorado have produced such diversified minerals as the region within a radius of four miles from the old mining town of Turret in Chaffee County. Fifty years ago, during the heyday of the old Calumet iron mine, fine specimens of sagenitic quartz crystals and epidote were finding their way into museums and private collections. At present few Colorado localities, it seems, are less known to collectors.

Soon after the turn of the present century the Calumet mine closed down; gradually the other mines and quarries ceased operations, until eventually Turret became a ghost town with one lone inhabitant. Today the region shows signs of renewed activities. When in July, 1946, Wendell Mohr, Tyke and John Meissner, with the writer, visited Turret we found a population of five, including a baby in arms.

The minerals and ores mined or quarried here include gold, silver, various copper ores, manganese, magnetite, fluorite, graphite, feldspar, beryl and calcite. Nor is this list by any means exhaustive. Besides those minerals of commercial value, many others in crystal form of interest to collectors occur as associated minerals. Some of these will be mentioned later.

Around Turret the rugged terrain is slashed by deep gulches that expose in their side walls the uptilted stratifications. Often the line of contact between wholly dissimilar rocks arrests the attention. In brief, geologically it is a land of fairly intensive metamorphism, and of considerable erosion that has left its record in the form of hogbacks and bold pinnacles.

We came to Turret via the "Circle Drive," onto which road we turned from State Highway 291 precisely one mile north of Salida. The "Drive" quickly resolved into a devious, narrow dirt road that trended in a general northerly direction. Eight miles from the highway we arrived at the junction where the main road, turning to the right, leads past the old Calumet mine and on to Whitehorn. However, we chose the lefthand road leading to Turret. This is another dirt road, winding and replete with steep pitches that will tax the stamina of a car in second gear.

From the junction on for about two miles along the Turret road one may observe small, tentative feldspar quarries. We stopped to examine several. At the second quarry Wendell spied a beryl crystal three inches in length by one-half inch in diameter which he was able to cut from the parent rock by using a diamond-point and square-point. Many smaller crystals were implanted in that same section of the wall. The beryl obtained here is pale green and opaque.

Garnets, almandite variety, up to more than an inch and a half in diameter, may be found in the deep gulch which bisects the scattering of log cabins that is Turret. Except for size—these are diminutive by comparison—they remined one of the famous "Salida Garnets" obtainable at the now inoperative Sedalia copper mine located some miles southwest of Turret and in that same group of hills. Parenthetically, the Sedalia mine may be seen from U. S. Highway 285, about 4 miles north from Salida. Ingress to the mine should be made from that highway.

Near the town black tourmaline (schorl) occurs in white quartz. The crystals are slender pencils up to three inches long. Wendell obtained an interesting specimen of the type Dana describes as representing "interrupted curvature."

From Turret we retraced our route to the junction where we turned onto the Whitehorn road. Driving on past the Calumet mine, we stopped at a small quarry where two men were loading large blocks of gleaming white calcite into a pickup truck. This material was being shipped to a manufacturer of poultry feed. No crystals had

been found here, but they advised us to visit a quarry located about six miles up a nearby gulch where columbite and tantalite were available in crystal form.

We intended to visit the columbite quarry, but after contemplating the distress of a truck stalled on a steep gradient, we decided that passenger cars were not designed for adventuring upon a road so hazardous. A twelve mile walk—round trip—was out of the question since our time was limited to one more day here, so we are unable to verify that report.

At nightfall we pitched camp—if the simple expedient of spreading bedrolls upon the ground may be so designated—be ide a grove a half mile from the Calumet mine. One objective in visiting this region was to relocate, if possible, the ledge bearing small, blue sapphire crystals discovered by the early-day prospector N. D. Wanemaker. (1) The sapphires were reported as occurring in a stratum of corundum-schist. It was already apparent, however, that our time limit precluded prospecting an area so vast, and since we were unable to contact anyone who could cast light on the subject, we decided to restrict our efforts to searching the old mine dumps.

Accordingly the following day was occupied in examining the extensive workings of the Calumet mine. Pyrophyllite (2) in radiating sheaves was readily obtainable in specimens of any size from small to museum pieces. Light-green radiated actinolite was plentiful, and afforded even more interesting specimens than the former. Magnetite in tiny resplendent octahedrons implanted on a dark rock was available in fair sized specimens, magnetite ore being the product of this mine. Small epidote crystals were found attached to quartz and to calcite.

Here again the prize of the day, of the trip perhaps, fell to the lot of Wendell Mohr who found the two best sagenitic quartz crystals, five and three inches in length respectively. These crystals, water clear, are laced with fibrous green epidote. (Early-day reports designate byssolite as the fibrous mineral). The quartz crystals observed here taper to a point, without the usual terminations. When the mine was in operation epidote and quartz crystals were found occupying pockets in a stratum of metamorphic rock in the hillside just above the highest tunnel.

The old mine workings, comprising adits, shafts, tunnels, open cuts and innumerable dumps, extend for all of a quarter mile along the hillside, and for an equal distance from base towards the summit. Our best results came from the upper workings.

Doubtless the boys have adequately appraised the Turret locality. While we were packing specimens preparatory to breaking camp, Wendell remarked: "This proposition is just too big for a two day's stopover; we'd want at least ten days here so we could prospect the side walls of every gulch."

Tyke, wrapping a favorite specimen in tissue paper, paused to suggest: "We'd need a few sticks of powder just in case."

John, playing "Oh, Susannah" on the ocarina, broke off in the middle of a bar to interpose: "What you fellows have in mind would mean a world of hiking!"

The writer endorses all three opinions.

We take this opportunity to thank Wendell's father, Major Clifford Mohr, not only for transportation, but while we chipped rocks until dark, he kept the campfire burning as a welcome beacon.

REFERENCES:

(1) Colorado Scientific Society Proceedings, vol. 2, pt. 3, 1887, pp. 163-166, and 176-177.

(2) Identification made by the Colorado School of Mines.

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TWO WORLD WARS HAVE DRAWN HEAVILY UPON UNITED STATES RESERVES OF METALS AND MINERALS

Huge demands during two world wars have drawn heavily upon United States reserves of metals and minerals although the country still has abundant resources of the most essential, according to the recently published Winter Issue of *THE INDEX*, quarterly publication of The New York Trust Company.

The study warns, however, that "the security and prosperity of the nation call for a continuing appraisal of its metal and mineral resources, together with a program of research and development that will guarantee a supply sufficient for commercial use and for defense.

"Great as are its resources, United States reserves of some important metals and minerals have been depleted by unprecedentedly high production during the last five years, while normal development of additional reserves has not proceeded because of the manpower shortage and the necessity for concentrating all attention on production to meet war requirements.

"Further, prices of metals, an important factor in bringing about the utilization of marginal reserves, were artificially low during the war, the ceiling prices being kept consistently below world prices. During the depression years of the 1930's, moreover, low prices for metals, combined with high taxation which discouraged capital investment, likewise slowed down the development of new reserves.

"Consequently, faced with a huge demand by consuming industries, some branches of the metals producing industries are unable to furnish these in sufficient supply to meet present enormous consumption requirements, which include demands for industrial goods accumulated during the war. Zinc, lead and copper are among the metals so affected by the current 'consumption' bulge.' In addition, the United States has always depended upon imports for certain metals and minerals, such as tin, mercury, manganese, tungsten, nickel, asbestos, quartz crystals, and industrial diamonds.

"Imports gave essential aid to United States military strength during World War II. The United States had to import 65 different metals and minerals from 53 countries, and the value of these wartime imports exceed $2 billion. Yet this country's exports of mineral products during the war, as in all other years since the early 1900's, far exceeded imports."

The study points out that most of the minerals in deficient supply in the United States, except graphite and titanium ore, are available, at least to some extent, from other sources on the American continent or its neighboring islands, although the American continent is not the cheapest source of United States supply for certain metal and minerals, such as tin, large quantities of which are imported from the Far East.

"Stock piling of minerals and metals in short supply, already under way," *THE INDEX* says, "is essential both through imports and through a program of government buying of domestic materials, particularly in times of business recession, that will maintain utilization of resources and encourage development of reserves. Such program need not involve subsidy payments.

"There seems to be ample ground for the belief that further exploration by the industry will uncover additional reserve. In addition, research and improved technology will no doubt continue to reveal ways by which marginal resources may be used to better advantage, A more intensive prosecution of a conservation program that will prevent the waste of natural products is indicated.

"Whatever deficiencies may exist need cause little alarm as to the national security if action is taken to guard agains serious shortages should the Nation again be involved in a global conflict."

A WORD ABOUT SOCIETIES.

BY DeWITTE HAGAR

Past President of the Los Angeles Lapidary Society and now head of the Lapidary Equipment Division of the Felker Manufacturing Company of Torrance, Calif.

It is a source of gratification to anyone seriously interested in the art of cutting and polishing stones to see the tremendous growth and spread of new mineralogical and gem societies all over this country. A short time ago it was a difficult matter to secure any information regarding this most interesting art and pastime but now it is a different story. Many of these societies are organized for the study of minerals but a goodly proportion of them are also including the art of cutting and polishing in their scope.

I am glad to see this growth because it means that more and more people are becoming interested in a worthwhile idea, one that will afford them a great deal of real pleasure and enjoyment throughout their lifetime. That is a wonderful thing about this hobby, the fact that your interest does not wane or cool off as it does in so many hobbies, but, rather, it increases from year to year. Aside from the information to be obtained through membership in such a society, there is the social side which, if properly developed, can mean so much to the members. I have formed some wonderful friendships through my interest in rocks and my membership in various societies, friendships that I value highly and that I would never have made otherwise.

My advice to anyone interested in collecting rocks, whether to cut and polish or merely to form a collection, is that he join a society if there is one in his vicinity or, if there is not one already formed, to seek out a few kindred souls and organize one promptly. Most of the established societies will be glad to furnish information to prospective groups and in some instances to help in the organization itself. They will furnish outlines of their set-ups, by-laws, or even assist in the details of incorporation.

One feature that has been neglected by most of such organized societies thus far has been their failure to make their existence known to Chambers of Commerce, newspapers, museums, or libraries, or other agencies where information regarding contact with them may be made. This, it seems to me, is very important. Many people do not know where to turn to secure information on this subject and the societies would be doing themselves as well as the public a good turn by having such information available at some central source. It is to be hoped that this will be corrected in the very near future.

MRS. WILFRED C. EYLES

(Obituary Notice)

It is with much sorrow that we announce the death of Madge Eyles, beloved wife of Wilfred C. Eyles, of Bayfield, Colo., who passed away in the evening of Dec. 3rd, 1946, at the Mercy Hospital, in Durango, Colo., where she had been confined for several months. Death was due to cancer.

Mrs. Eyles was well known to hundreds of West Coast collectors and mineral society members. Her smiling face will be missed at the coming Conventions by those who knew and loved her for she was one who had everyone for a friend and not a single enemy.

Besides her husband, only a sister and two nieces (who reside in Vancouver, Br. Columbia, Canada) survive. Mrs. Eyles was 51 years of age at the time of her passing.

The heartfelt sympathy of the Rocks and Minerals Association is extended to Mr. Eyles, a fellow member.

Buy your specimens and supplies from established dealers—in other words buy from dealers advertising in *Rocks and Minerals*.

ROCKS AND MINERALS FOR ANCIENT AMERICAN RECORDS

BY JOHN L. CROSS
Salt Lake City, Utah

We who have sons feel a desire to record for their information and future guidance, our thoughts, our advice, and the things we see that impress us. We desire at times to leave a bridge to span the faults over which we have struggled. As we perform accomplishments worthy of comment among fellow men, we desire that these things also be recorded for our posterity either by a written record or by word of mouth. These desires, being human, were found among the primitive peoples of America. Though the Mound Dwellers of Mississippi and surrounding waterways had no uniform system of writing, no alphabet nor characters they could call their own, still they endeavored to record for their posterity and for future man, their offices and their accomplishments by whatever means at their command. Some used picture writing, some used marks unknown to modern man and some used the letters of the Old World.

In as much as some events and happenings were worth recording, materials of a lasting nature were used to preserve them. These materials were rocks and minerals of such a structure as to be easily inscribed and still be permenant enough to withstand the forces that destroy records of a more perishable nature. For this purpose soft metals and soft stones were used. Reports of the finding of records on such materials have come from many parts of the United States, but mainly from the areas occupied by the Mound Dwellers. Recordings on non-perishable materials dates back to pre-historic times while the recordings on perishable materials are more often of the historic period.

Eagerness to receive the glory and attention for reporting a find of such records, has led to some unscrupulous individuals producing fraudulent records. Some supposed records have been brought forth in the fever that have later been found to be something entirely different upon careful examination. Such an instance was the report of the Fremont plate found in Lower Sandusky, now Fremont, Ohio. After close examination this plate proved to be graphic mica and the writings proved to be natural markings of the stone. There have, however, been many tablets and records found that have withstood a century of questioning and are still acceptable as true records of the ancient peoples of this nation. It is this group about which we are most concerned.

The ancient Americans as a whole seem to have been very well acquainted with copper as the numerous ornaments show. The Mound Dwellers of the Mississippi drainage area left many of these relics including many copper plates. These peoples obtained their copper by journeying northward through the Great River areas to the Great Lakes; finally reaching Isle Royal, the source of most of the copper of early man in Eastern and Central United States. That an excellent knowledge of metallurgy was possessed by these people is attested to by the alloys found among their relics. Brass has been found and reported many times.

One of the most outstanding records of this country are the Tuccabatchey plates reported by William Bolsover in July of 1759.

"In the Tuccabaches on the Tallapoose River, thirty miles from the Allabahama garrison, were two brazen and five tables of copper." "They were," according to Bolsover, "very sacred to the Indians and played a prominent part in their religious ceremonies." One copper plate was a foot and a half long and seven inches wide, the other four were shorter and narrower. The shape of the two brass plates was circular, about one and one-half feet in diameter. Bracket (an Indian) was told by his forefathers that there had been

among his people many more plates of other shapes and sizes.

The gold plates found in Cincinnati, Ohio, in 1847 were outstanding in their workmanship and show great care and pride taken by some ancient artisan skilled in the making of records. These plates were found nine feet below the earth's surface and a few feet above the high water mark of the Ohio River. One plates was of fine gold three or four inches in length, averaging three-quarters of an inch in width and about $\frac{1}{8}$ inch in thickness with edges scalloped. On the face of this plate was set another plate of the same material and the two were fastened together by two pins running through both plates. The latter plate is beautifully engraved with raised characters. Cuts and descriptions of these plates were published by two different publishers at the time of their discovery, and Dr. Wise, rabbi of the Jewish synagogue in Cincinnati and editor of the Hebrew newspaper there at the time of the find, pronounced the characters mostly ancient Egyptian.

The kinderhook plates found in Kinderhook, Pike County, Illinois, are interesting in that they are a definite proof of the use of brass for record making. This group consists of six bell-shaped brass plates perforated at the top and held together by a ring, similar to a modern day looseleaf. Translations of their writings show them to be a personal record. Descriptions in drawing and photograph of these plates are available from many sources.

There are other records on metal that have been unearthed in the United States that are not recorded here. Many such records are also available for examination that have been found in South and Central America and in countries of the Far East.

Several tablets including the Mississippi Tablet found at Lafayette Bayou, Issaquena County, Mississippi; one of the Little Miami Valley Stones; the Cincinnati Tablet found at the corners of Fifth and Mound streets in Cincinnati, Ohio, in 1841; and the Berlin Tablet found in Berlin, Jackson County, Ohio, were all made of fine grade brown sandstone. The Grave Creek Tablet found on June 16, 1838, was a disc of white sandstone and the Davenport Tablets were made of coal slate. Many tablets of polished slate have been found among the ruins of the Mound Dwellers. Several other stones have been found that bear mention but in most instances the type of stone or rock has not been reported. This group includes the Willmington Tablets found three and one-half miles from West Ohio near the turnpike leading to Harveyberg. Two stones composed the find, one of Waverly sandstone and is referred to as the Richardson Stone, the other tablet is know as the Welch Butterfly and is of a stone not identified. One of the Little Miami Valley Stones is described as a flattened dark green boulder covered with a network of crossing lines forming quadrangular divisions of various sizes. This again maybe a natural marking similar to those found on the Fremont Plate or they may be the result of some Ancient Artisan's urge to create a geometric pattern on stone.

The Newark Holy Stones are probably the most famous of these ancient stone tablets found in this country and they have been the objects of much controversy and argument as to their origin and authenticity. The stones, four in number, were found between 1860 and 1865 about one mile southwest of Newark, Ohio. The inscriptions are of a religious nature and one is reported to bear an inscription of the Ten Commandments while another bears the head of Moses with his name written in Hebrew above. One of these stones was found buried in a stone box. Identification of either the stones or the box is unknown to the author. For nearly one hundred years no one has advanced evidence to prove these stones fraud though many efforts have been made to do so.

The near future holds much for American Archeaology. Science is closer than ever before to translating correctly

the ancient records. The writings of the Mayas, the Incas, the Aztecs and their predecessors; the picture writings and hieroglyphics of the Basketmaker, the Pueblo, and the Cliff Dwellers; the emblems and sacred symbols once credited to solitary groups of the old world are found in great profusion across the entire length and breadth of the New World. All of these are nearer to translation than ever before. Science in its relentless quest for knowledge is breaking down the great barrier that once existed between ancient and modern man. Cooperation and tolerance are painting true pictures of ancient life and through the maize of these things will emerge the light of truth and knowledge. We will find that man, ancient or modern, is basically the same. The greatest differences will be physical attributes and his interpretations of law.

Who knows what future man may say of us?

SULFUR IN COSTA RICA AND GUATEMALA

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 38)

Costa Rica.—Although several deposits of sulfur are known to exist on the slopes of the Volcano Poas and are being worked in a rudimentary way with antiquated methods, production is insignificant and has not attained commercial importance.

About 40 to 50 percent of the sulfur required in Porto Rica is consumed by several of the more advanced local sugar mills in their sulfination towers, in which cane juices are cleaned of most of their impurities in order to obtain a whiter color in the refined sugar. The remainder is consumed chiefly by agriculture, in cattle-feed preparations, and mixed with white arsenic to combat leaf-cutting ants. Smaller quantities are used by the match and fire-works industry and the pharmaceutical industry The sugar mills utilize stick or roll sulfur, and other consumers use chiefly flowers of sulfur.

Although most of the sulfur consumed in Costa Rica was supplied from European sources before 1939, it is believed that local requirements will continue to be purchased from the United States. Moreover, demand should increase in the next few years to more than 100,000 pounds per annum.

Sulfur is purchased generally by large wholesale drug importers and large consumers, such as the sugar mills, through a commission agent resident in San Jose. Although most of the material is consumed outside of San Jose, it is distributed usually through that city to small wholesalers and retail druggists in outlying urban centers. (Third Secretary of American Embassy J. Ramon Solana, San Jose.)

Guatemala.—The output of sulfur in Guatemala is relatively insignificant, usually totaling 10 or 15 metric tons annually. It is consumed entirely by the chemical firm that mines it. Owing to scattered deposits, high cost of refining equipment, poor transportation, and other factors, it appears that there is little chance of increasing Guatamala's sulfur production materially.

About 90 percent of the sulfur required in Guatemala is consumed in refining sugar, 8 percent in chemical production, and 2 percent in pharamaceuticals.

R & M Gets Around!

Editor R&M:

I am very pleased with the pulling power of *Rocks and Minerals*. In the past month I have had orders from Canada, Australia, Mexico, England, and China (in addition to many from the U. S.). Your swell magazine sure gets around!

Lionel Day
New York City

Dec. 9, 1946.

SOME PHILIPPINES COPPER MINES

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 7)

The following descriptions of copper mines in the Philippines are taken from a report by S. Kondo, a Japanese geologist assigned to examine mines and mineral deposits in the Philippines during the Japanese occupation. Kondo's ore reserve figures in most instances are much higher than the available pre-war estimates mostly by American engineers.

Luzon Island

Mankayan mine, 108 kilometers north of Baguio, was operated by the Mitsui Mining Co. The mine consists of a gold and enargite quartz vein 1 kilometer long, 1 to 2 meters wide, and 500 meters deep. The ore contains 2.5 to 2.8 percent copper and 3 grams of gold per ton. Durng 1944, 300,000 tons of ore were treated by flotation and 7,500 tons of copper were recovered. Ore reserves are estimated at 3,600,000 tons.

Subol mine, in the northern part of Pangasinan Province, was under control of Teikoku Kohatsu Mining Co. The ore contains 6 percent copper in the oxide zone and 2.3 percent in the sulfide zone. The mine was not operated by the Japanese. Ore reserves are estimated at 100,000 tons.

Batangas mine, in the northern part of Lobo village about 30 kilometers from Bantangas, was operated by the Taiheiyo Mining Co. Copper content of the ore is 6 percent in the oxidized zone and 4 percent in the sulfide zone. The mine consists of many small deposits. In 1943, 4,800 tons of ore containing 4 percent copper was produced and shipped to Japan. Ore reserves are said to be 2,000 tons.

Paracale mine, about 270 kilometers west of Manila, contains gold-bearing copper, galena, and zincblende. The ore contains 5 to 7 grams of gold per ton, 2 percent copper, and 5 percent lead. Capacity of the flotation plant is 500 tons of ore daily. Original ore reserves were supposed to be 20,000 tons. The mine was operated by the Mitsubishi Mining Co.

Rapu Rapu Island

Hixbar mine, in the we tern part of the island, was operated by the Nippon Kogyo Mining Co. The deposit is a copper-bearing pyrite vein containing 3 percent copper. Daily output was about 100 tons, and 48,000 tons of ore was shipped to Japan. Ore reserves, according to present investigation, were estimated at 45,000 tons.

Cebu Island

Toledo mine, on the northwestern side of Cebu Island was investigated by Towa Kogyo Mining Co. but was not operated. The copper-pyrite ore contains 1.8 to 2.2 percent copper. Positive ore reserves are estimated at 80,000 tons and probable reserves at 200,000 tons.

Negros Island

San Remegio mine, on the west side of the island, was investigated by the Ishihara Sangyo Mining Co. but was not operated. The ore contains 2 to 8 percent copper. Ore reserves are estimated at 500,000 tons.

Mindanao Island

Surigao gold-copper mine in the northern part of the island was under control of the Sumitomo Mining Co., but no mining was done. The ore contains 5 to 6 percent copper and 20 grams of gold per ton. Positive ore reserves are estimated at 250,000 tons and probable reserves at 700,000 tons.

Tumbagan Island

Tumbagan mine is in the middle of the island, which is 4 kilometers east and west and 2 kilometers north and south. The mine was investigated by Kondo and the Taikeiyo Mining Co. but was found to be too small to operate. Ore reserves are estimated at 2,000 tons containing 6 to 8 percent copper.

CORUNDUM IN BRAZIL

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 20)

Corundum has not been produced on a commercial scale in Brazil since 1944. Just previous to that time, exploration, and production were greatly stimulated, especially in the States of Ceara and Paraiba, because of the acute need for this strategic mineral for the war production program.

In Brazil, common corundum is produced by nomadic miners working in remote unsettled parts of the interior. It is obtained by surface or open-pit operations almost entirely by hand labor. Stocks accumulated by storekeepers and traveling buyers eventually reach dealers in coastal towns.

To date, the only traceable production of corundum ore, which totaled 75 metric tons, was shipped to the United States from the port of Fortaleza in 1944.

The deposits in the State of Ceara appear to have a large reserve, but the commercial value hinges upon the possibility of economical separation of associated diaspore. Most of the corundum gem stones in Brazil, such as sapphires and rubies, usually are picked up in the river beds of the interior by "garimpeiros," who sell them to traveling buyers. They eventually reach the Rio de Janeiro gem market.

Three varieties of corundum are found in more than 40 occurrences in Brazil.

1. *Common:* Also called adamantine spar. It includes the varieties without value for the jewelry trade but which may be used as abrasive.
2. *Gems:* Sapphire (various shades of blue), ruby (roseate to pigeonblood red), oriental topaz (yellow), oriental emerald (green), oriental amethyst (purple), asteriated or star sapphire, asteriated ruby, Alexandria sapphire (blue to natural and reddish to artificial light).
3. *Emery:* Impure varieties, generally in a granular compact shape of gray to black tone, with inclusions of hematite, magnetite, and other minerals. Utilized as an abrasive.

The folowing list of reported occurrences, in geographic order, gives an idea of how widespread corundum is throughout the country. Moreover, it leads one to believe that innumerable other deposits might be discovered when more commercial interest in this material is manifested and more garimpeiros are encouraged to prospect for it.

State of Meranhao

Rio Guripi: Alluvial sapphire grains in various shades of blue, about 2 mm. thick, small, clear-red rubies, and fragments up to 2cm. dark-green corundum, more or less opaque, have been found.

State of Ceara

Municipality of Granua: Extensive deposits of corundum were discovered on the Frazenda Angiquinho, about 3 kilometers from the town of Granja. Crystals of a bluish-gray tone and granular structure, ordinarily weighing hundreds of grams and sometimes many kilos, are found embedded in mica. The corundum is always associated with diaspore, which is difficult to separate because the difference in specific gravity is small—3.5 for diaspore and 4.0 for corundum. The reserves are estimated at several thousand tons.

Municipality of Santa Quiteria: The corundum deposits of Santa Quiteria were discovered during 1943-44 at the time of the great demand. It was mined, as other minerals, by the garimpeiros in the vicinity of the pegmatite dikes from which it appears to originate. This hypothesis has its founda-

tion in the fact that there are many pegmatites in this region and that some corundum crystals retain incrustation of feldspar and mica. Corundum is found in many localities in concentrated spots and usually appears in barrel-like form or in alluvial pebbles measuring up to 8 cm., in brown and dark-gray shades, with pseudo-cleavage and twinning striations. Reserves in this area are very large.

Cream-colored translucent corundum is found in the pegmatite dikes in many regions of this State, but production is small. Corundum crystals were obtained from the pegmatites in the municipalities of Taua, Cachoeira, Senador Pompeu, Quixada and Quixeramobim.

State of Paraiba

Corundum embedded in mica gneiss was mined in the municipalities of Equador and Patos during the war procurement program. Several tons of crystals were exported from Fortaleza, Ceara.

State of Baia

Corundum, some of it in the form of rare ruby grains, has been found in many alluvial diamond deposits along the Rio Paraguacu in the municipalities of Canaveiras, Camacari, Serrinha, and Juazeiro.

State of Espirito Santo

Small sapphires and alluvial rubies have been found in the Itapemirim River.

State or Rio de Janeiro

Occurrences of large, gray corundum crystals were discovered in the municipality of Nova Iquacu.

State of Sao Paulo

Small corundum crystals of bluish-gray and dark-red shades were found in Ribeira de Iguape, Zona de Franca, and in the Municipalities of Sao Roque and Apiai.

State of Minas Gerais

Small crystals and alluvial ruby grains of a beautiful color were found in the Municipality of Monte Carmelo. Crystals of various sizes also were discovered in the municipalities of Uba, Conceicao, Diamantina, and Sao Domingos do Prata.

State of Goiaz

Sapphires and other colored crystals were found in the sands of the Rio Olaro, a tributary of the Araguaia River.

State of Mato Grosso

Greenish-blue sapphires and natural-colored corundum crystals were picked up in the Coxim River.

No statistics of consumption or exports are available. According to official Brazilian statistics, no corundum has been exported.

As a study of material obtained from Ceara and Paraiba in 1944 revealed that the corundum in these deposits of the Northeast is almost always assocciated with diaspore not easily separable, the United States suspended purchases at the beginning of 1945.

The opportunities for the sale of crude corundum in Brazil are very limited, but for prepared abrasive products manufactured in the United States from corundum, the market seems brighter. The situation is subject to change, however, should the Brazilian producers begin to prepare their own abrasive grain.

The national (Brazilian) Bureau of Mines is actively interested in finding a method of separating the diaspore from the corundum and thereby recovering a commercially marketable product, particularly in connection with the deposits in the Northeast. In the event that these efforts should be successful, Brazil would be selfsufficient as far as corundum requirements are concerned. The distance from the producing areas to the manufacturing or industrial centers, however, may be considered as a limiting economic factor.

The State of Sao Paulo, as the chief industrial center of the country, is the primary manufacturer and consumer of abrasive materials. There is also a small production in Minas Gerais and in Rio de Janeiro.

(American Clerk Katherine Kory, Rio de Janeiro.)

THE NEW QUARRY AT LOCKPORT, N. Y.

BY PAUL E. KILLINGER

120 W. Winspear Ave., Buffalo 14, N. Y.

In the Spring of this year a new quarry was opened as Lockport; this new section being about ¼ mile from the old quarry and about ½ mile from the Erie Barge Canal. The old quarry is flooded with from five to fifteen feet of water, and intermittent pumping operations are carried on to keep the water level here below the floor of this new quarry. It is however impossible to pump the old quarry dry for it lies many feet below the water level in the Canal and the fractured Lockport dolomite easily transmits water into the quarry from the Canal.

Mineralization in this new section is high, with most of the best cavities occurring in the western end of the quarry. Many occurrences of fine clear selenite some pieces enclosing singly and doubly terminated calcite crystals were noticed, and many excellent pieces collected, on a recent field trip. This occurrence is relatively unusual for such massive, yet water-clear, selenite was found only very rarely in the old quarry. Sometimes interspersed, and almost always in the same piece of dolomite rock, will be found cavities of beautiful pink dog-tooth dolomite crystals. This mineral is not at all rare at the quarry of course, but the deep and fine coloring of some of the cavities at this new quarry impressed me since really finely colored and finely crystallized dolomite is not extremely usual.

One small occurrence of pyrite crystals was noticed, but as has been the rule for many years, the pyrite is found only as a coating of pin-point crystals on dolomite or calcite crystals and rarely as a coating on the red mud that often fills the cavities lying near the surface.

The author collecting in the new quarry.

The old (Pekin) quarry now full of water. (Author in foreground).

Of great interest, I think, is the fact that earlier this year I collected a large piece of dolomite rock containing a two inch cavity studded with two one-quarter inch crystals of sphalerite. This is the only occurrence, known to the author, of crystallized sphalerite being collected at this location. However massive sphalerite, in pieces up to one-half inch and firmly imbedded in dolomite rock, have been collected.

It seems that this new section of the Pekin Stone Quarry will furnish many more fine specimens as the old section had in the past.

REFERENCE

The Pekin quarry at Lockport, N. Y., by Paul E. Killinger, *Rocks and Minerals*, May, 1943, pp. 136-137.

FOSSILS COLLECTED IN TEXAS FOR CHICAGO MUSEUM

Having completed three months of trudging back and forth over an arid area in southwestern Texas on the Mexican border, up and down hills and across desert to an aggregate of several hundred miles, in the interest of advancing paleontological science, Bryan Patterson, Chicago Natural History Museum's curator of paleontology, James H. Quinn, chief preparator, and a volunteer companion, John Schmidt of Plainfield, Ill., have returned bringing a collection of more than 200 specimens of prehistoric animal fossils.

The specimens are principally of mammals of the Oligocene period, about 40 million years ago. Outstanding are several skulls of Titanotheres (large horned animals whose skulls alone average 150 to 200 pounds each), skulls of amynodont rhinoceroses, and partial skeletons or skulls of small three-toed horses, an animal that appears to be a sabertooth hyaenodont, another called an oreodont, a large rodent, and the remains of the nesting, or roosting place of a large extinct bird of prey containing the bones of its rodent victims.

Outstanding interest is the occurrence, within the same formation as the bones, of fossil footprints. These were found on the hardened surfaces of what were once stretches of sand, and are as perfectly preserved as if made yesterday. Casts were taken of many of the tracks of titanotheres, oreodonts, three-toed horses, carnivores and birds.

The area traversed lies about 50 miles south southeast of Van Horn, Tex., which is about 120 miles from El Paso and between the latter and Big Bend National Park. Most of the specimens were collected in an area approximately three miles wide and six miles long, which had to be prospected intensively, largely on foot, to find the fossils. The methods employed in hunting fossils are similar to those in prospecting for minerals. The members of the expedition had to build four miles of road to take their truck across rugged off-the-highway country in order to complete excavating and loading of the largest and heaviest specimens.

Mr. Patterson and Mr. Quinn are now back at their museum posts ready to begin the long and intricate task of removing the fossils from the matrices of rock in which they were preserved for aeons, and to commence studies that will determine the place of the specimens in paleontological classification and trace as far as possible their bearing upon the whole question of evolution.

DIAMONDS IN BRAZIL

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 23)

The Brazilian press recently reported some interesting findings in regard to diamond deposits in the State of Piaui, based upon the report of the Director General of the Department of Agriculture upon his return from an inspection trip made at the request of the State Government.

According to this report, the diamond deposit of Gilbues, which was being worked at the time of the visit, is about 9 kilometers southwest of the city of Gilbues, seat of the municipality of the same name. According to the estimates of experienced prospectors (garimpeiros), who know most of the diamond diggings of Brazil, the diamantiferous zone in that region covers an area of 14,000 square kilometers, including parts of the municipalities of Gilbues, Santa Filomena, Parnagua, and Corrente. The part that is being worked covers 30 square kilometers.

The deposit was discovered in April 1946, and at the time of the inspection visit in May, 1,000 diamonds had already been mined. Only 14 suitable sets of 3 sieves and one pan were being used, the remainder of the garimpeiros having to resort to sieves made on the spot of palm trees.

In less than 2 months, 2,000 persons had flocked to the deposits, and large caravans continued to arrive daily. The garimpeiros marveled at the ease with which the diamonds could be mined and the productiveness of the deposit. The gravel is picked up some distance away from running water and carried to the creek for washing. Deep excavations have not yet been made. The ground was dug 1 or 2 meters for a test, and the results were positive. Some diamonds were found on the surface without digging. During the last week of the visit of inspection, more than 300 diamonds were recovered. (No-where in the report is the caratage stated.)

The inspection party found many exploration sites, called "catas" (diggings), already marked off. Many of the catas belonged to one prospector, who reserved to himself the right of beginning prospecting operations whenever it suited him. After this irregularity was brought to the attention of the chief police inspector because of the harm that might come to the State throught restraint of output, the ordinary time limit of 8 days was then fixed for the initiation of operations on each digging. However, when the interested operator must bring his personnel from a long distance, a longer time limit would be allowed.

The Director General's report to the governor of the State of Piaui, made after he had inspected the area, recommended measures for the development of exploration operations in the Gilbues diamond deposit and construction of a permanent aviation field (the one being constructed would serve only in the dry season). It was felt that it would be absolutely necessary to build an airfield where planes could land at any season in order that the region might be easily accessible to diamond buyers. Also recommended were reconstruction of the wagon road from Floriano to Bom Jesus and lengthening it as far as Corrente via Gilbues, opening another road from that city to Santa Filomena for a supply road to the garimpeiros and as a quick means of transportation when necessary, and the purchase of 200 sets of suitable sieves, 1,000 picks, 1,000 shovels, 1,000 bar points, and 1,000 hoes for sale to the garimpeiros at cost price through the Municipal Government.

The route taken by the Director General's inspection party from Teresina, the capital of the State of Piaui, was by river up to Floriano. Because the wagon road that connects Gilbues with

(Continued on page 39)

ZIRCONS NEAR SAN DIEGO, CALIF.

BY MGY SGT. JOHN O. GRIESBACH, USMC

Some few nights ago I was reading over some of the articles in a recent R&M magazine which I had skipped previously and noted that a location was wanted in regards to the occurrence of zircons near LaJolla, or San Diego, California.

Several years ago, prior to the great Nip Insult, I was a member of one of the Marine Corps' early Anti-Aircraft Battalions. I worked with the recording section, filming with a telescopic movie camera the effects of AA firing on sleeve targets and the "tracking" at night of aircraft targets with large and powerful searchlights. On one of the times that I was detailed to night problem searchlight practice, I had to go out to the set-up area in the late afternoon to choose a site at which to mount the recording theodolite and to emplace the mounting column.

Now, while making this reconnaissance, I ran across a good many large chunks of a quartz-feldspar gangue rock which contained innumerable nicely formed crystals of tan to brown zircons along the road which led into what was then the Kearny Mesa dive-bombing range (Navy) about two miles south and east of the little town of Miramar—about twelve miles or a little over from San Diego. The crushed rock on the road was also noted to contain much zircon, as crystals embedded in the quartz-feldspar matrix. They were mostly from 1/16th to about ¼ inch in length and breadth.

I tried later to find out just where this road topping had been derived from, and if the location was in the immediate vicinity. I was told that it had come from a civilian-owned but no longer active quarry on the flank of Black Mountain, a local low butte on the edge of the naval reservation. I hiked over there on a week-end and found where some rock had been quarried from the face of the butte, and where a rock crusher had been set up at one time but could find only a few pieces of rock which contained zircon. My supposition was that the quarry had cut through and removed most all evidences of a small pegmatite dike in which the zircons had occurred during the time that the quarry was in operation.

I have done considerable hunting up and down the beaches and over the country around LaJolla, but outside of a few odd pieces of stream (?) float which contained minute zircon, have had no real luck in locating a good source of zircon.

While stationed there in San Diego at that time, I had the pleasure of knowing Mr. Ware, the gemologist, and owner of a large jewelry store in San Diego. I told him of the occurrence of the zircon in the Black Mountain area and of the float which contained the small zircons. He was of the opinion as I am that several more, possibly better, pegmatitic occurrences are yet to be found in the San Diego area, and immediately northeast of the city, which will be found to contain zircon—and most likely other minerals of interest, even if worthless economically, to mineralogists and geologists. Mr. Ware has or had a great interest in the gem occurrences of Southern California, and principally in those deposits at and near Pala. He had a showcase full of uncut matrix specimens of gem minerals from his property there in his establishment, including some of the nicest water-blue topaz crystals I have ever seen. He showed me a faceted tear-drop pendant stone cut from one of these blue topaz crystals which was valued at about $2,000. It was about ¾ths of an inch in length, and about 3/16ths or ¼ inch in diameter.

The best is not TOO GOOD for you; therefore buy yourself good specimens.

MOSS AGATE AT AGATE, NEBR.

BY ARTHUR G. ELDREDGE

Meadville, Penn.

Looking over a back number of *Rocks and Minerals,* the Special Agate Number of 1936, I noticed that a good location for moss agate is not listed. The following notes, therefore, may be of some interest.

We were traveling through the West one summer and one place we visited was Agate, Nebr., to see Capt. Cook on his 50 *mile square* ranch where there are extensive fossil quarries. Agate is a tiny hamlet in about the central part of Sioux County (20 miles south of Harrison), in the northwestern corner of the State. (At the time of our visit, Agate consisted of only one building, about 20 feet square, housing the post office and a small grocery store). We were fortunate to follow the trail over the rolling grassy terrain. Capt. Cook's house is on the south side of the Niobrara River which with its meadows is about 300 feet below the general level of the plains.

Just below the surface of the ground is a layer of rock about 3 or 4 inches thick, mostly moss agate, on the edge of the plain on the north side of the river. We found plenty of the agate scattered over the banks, the agate is a transparent chalcedony containing beautiful arborescent and mossy inclusions. Capt. Cook said that people came after the agate in trucks and carried it away by the ton. It is evidently a very extensive layer.

The quarries on Capt. Cook's ranch have yielded many fine fossil specimens to the expeditions from numerous colleges and museums including many European institutions. Some of these quarries were in the sharp pointed buttes which are assumed to have been eddies in the once large glacial river that filled the valley of the present Niobrara. Several feet of the tops of these buttes consist of weakly consolidated brown volcanic ash, below is found a coarse, easily broken limestone and farther down a purple siliceous limestone which yields the best fossils. From the soft limestone we obtained some nice specimens of wrist bones of rhinoceros and teeth and jaws of some smaller animals. The marrow cavities were filled with large calcite crystals. Capt. Cook excited us by showing some lower leg bones of antelope fossilized with gem opal. In southeastern Wyoming we examined similar buttes and collected some camel bones from the shelves where they had weathered out.

In the same region one may see where the road has been cut through small banks which contain a layer of rock several inches thick and about 18 inches below the surface. It is mostly, I believe, insoluble calcium carbonate, often in large square crystals with depressed centers similar to salt which has crystallized very slowly. We assumed that the light rainfall had dissolved the surface alkali and carried it down to the limit of the rainfall penetration.

There are also in the same region, some extraordinary rock formations which so far are unexplained. They are perfect spirals, like the spokes in a staircase balustrade, varying in height from a few inches to several feet. When broken, the rock is found to contain fossils of small rodents. I was not able to find this formation, however.

Editor's Note: The rock formations mentioned above are called "daemonelix or devil's corkscrews and are found in the bare bluffs, buttes and canyon walls of northwestern Nebraska. See "The Devil's Corkscrews," *Rocks and Minerals,* Nov., 1937, p.341.

Pennsylvania's First Meteorite

The first known meteorite to be found in Pennsylvania was the Pittsburgh meteorite that was found in Pittsburgh, Allghany Co., in 1850. It was a very coarse octahedrite, weight 132.7 kgs. (292 lbs) and consisted of one mass.

Club and Society Notes

New York Mineralogical Club

American Museum of Natural History. New York, N. Y., Wednesday, Nov. 20, 1946.

The meeting was called to order at 8:00 P.M. Mr. Louis Cobert and Mr. Victor Pribil were elected to membership.

Dr. Kindle, treasurer, reported that the Club's new addressing machine had been received, Monthly notices of meetings and any special notices will now be sent to members by the Club.

Mr. Yedlin, chairman of the excursion committee, reported that the fall field trip was a complete success. Sixty-two members and guests attended.

At Pine Island, N. Y., allanite, arsenopyrite, bornite, apatite, calcite, chalcopyrite, chondrodite, fluorite, graphite, hornblende, molybdenite, phlogopite, pyrite, pyroxene, quartz, titanite, tourmaline, tremolite, pyrrhotite, and garnet were found.

Of these allanite had not been hitherto reported from the locality and was first found by Mr. Morgan.

At Franklin, N. J., allanite, apatite, biotite, calcite (4 varieties), caswellite, dolomite, epidote, fluorite, franklinite, gahnite, garnet, hancockite, hardystonite, hematite, magnetite, manganophyllite, microcline, olivine, pyrite, pyroxene, quartz, schefferite, sphalerite, willemite, and zincite were found.

More frequent excursions are being planned.

Dr. Holmes called the Club's attention to a number of interesting publications.

Vincent Shainin—Branchville, Conn., Pegmatite, reprinted from the American Mineralogist of July-August, 1946.

Ross and Hendricks—Minerals of the Montmorillonite Group, U. S. G. S. Professional Paper 205 B

McGregor—Simpsonite and other Tantalates from Bikita, Southern Rhodesia—British Mineralogical Magazine

The speaker of the evening was Professor Cornelius S. Hurlbut of Harvard who spoke on Modern Developments in Mineralogical Techniques. He described the usual methods of investigation that have been applied to minerals, but stressed the more recent refinements of techniques that enable more accurate measurements on smaller samples to be taken. Dr. Hurlbut spoke on blowpipe work, specific gravity determination, magnetic and electrostatic separation, infra red absorption, determination of index of refraction, polished sections of opaque minerals and several chemical methods such as micro chemistry, spectrographic analysis and differentioa thermal analysis.

X-rays were taken up in some detail, from their discovery by Roentgen to their application to mineral study by Von Laue, Bragg and others.

Recently two methods have been used more than others. They are the powder method in which the mineral is ground as fine as possible and rolled into the form of a needle or rolled on a thin glass rod and placed in the center of a camera. Using monochromatic radiation a characteristic set of lines is obtained for each mineral. This is very useful for identification.

A Rotation picture is obtained by rotating a crystal slowly about a known axis using X-rays of one wave length. The distance between planes of atoms can be computed and if we use different axes the crystallographic axial ratio can be computed.

A novel determinative table for minerals was demonstrated to the Club. It consists of a series of punched and slotted cards. By using a knitting needle, a number of minerals are eliminated for each physical property until only the sought for one remains.

Purfield Kent, Secretary

Pacific Mineral Society

A dinner meeting was held by the Society on Dec 13, 1946, in Scully's Restaurant, Los Angeles, Calif., The speaker was Mrs. Winogene Savage who spoke on "Minerals of the Yellowstone National Park, Wyo."

North Jersey Mineral Society

The 20th meeting of the Society was held on Dec. 12, 1946, in the Paterson Museum, Paterson, N. J. Wm. C. Casperson, Curator of the Museum, addressed the Society on the phenomena of fluorescence. The lecturer spoke of the importance of fluorescence as a means of the identification of minerals and other substances; as a method of detecting imitations; as a very efficient means of creating artificial light; and as a source of great pleasure to mineral collectors, many of whom had their own fluorescent exhibits.

New Hampshire Mineral Society

A group of mineral collectors met in Laconia, N. H., on Dec. 15, 1946, and formed the New Hampshire Mineral Society. The following are its officers: President, Paul H. Burroughs; Vice-President, Forrest L. Parmenter; Secretary, Robert K. Pittman; Corresponding Secretary, Charles A. Weeks; and Treasurer, Everett Corbett.

Mr. Weeks reports that there is lots of interest in the new Society and he extends an invitation to all mineral-minded individuals of his state to join the new club. Address him—Mr. Charles A. Weeks, Meredith, N. H.

Mineralogical Society of So. California

Bill Sanborn, Ranger Naturalist at Yellowstone National Park, spoke at the December meeting of the Mineralogical Society of Southern California on "The Geysers and Minerals of Yellowstone."

The first of all national parks to be established, Yellowstone is also the largest. It boasts not only an endless variety of wild volcanic secenery—hot springs, geysers, canyons and waterfalls but it also is famous for its wild animal life. The Geysers, however, are the biggest attraction. Here is found the largest number of geysers in the world. Iceland and New Zealand are the only other places where you find such phenomena in any such concentration.

In explaining just how a geyser works, Mr. Sanborn stated that the earth's crust, comparatively thin in this area. has underlying rocks that are cracked and fissured down to where superheated gases are being forced up from the molten lavas below. The rocks in the park region are Rhyolites of a light porous type which absorb quickly the fairly heavy rainfall and form an underground water table. This water seeks out the cracks in the rocks, fills them, and then the heated gases begin to heat the water in the cracks. It may just make it boil forming a hot spring, or it may store up steam pressure enough to finally expel the water with great force from the crevice. Then the tube thus emptied of water is refilled with the water from the water table and the process is repeated. Examples of regular geysers are the Jet, which erupts every five minutes, The Daisy, Castle, and of course, Old Faithful. Mr. Sanborn exploded the myth that Old Faithful is as regular as clockwork. Its average time between eruptions is one hour but this is only an average. The time as well as its height and duration of play varies from day to day. It is estimated that the geysers are depositing Silicious Sinter or Geyserite at the rate of 1/64 inch a year—a slow process but one non the less that has literally smothered the roots of the surrounding trees leaving them standing leached and white. The Giant, Bee Hive, and Giantess, examples of the largest geysers in the world, are also examples of the irregular type of geyser—sometimes going several years between eruptions.

Mr. Sanborn urges that visitors to the Park see not only the beauties along the beaten track but that they also seek out the more remote areas—Heart Lake Geyser Basin, a narrow canyon drained by Witch Creek; Sentinel Creek, a broad valley dotted with seven huge mounds—old geysers with the rainbow color of the algae living in the hot waters still comparatively unmarred by thoughtless tourists; Speciman Ridge, an area where seventeen fossil forests one on top of the other are buried in turn in volcanic ash with the trees standing upright; and the Gallatin Gateway in the northwest corner of the park where there is a square mile of standing fossil trunks. Carelessness causes many accidents in the Park each year that could easily be avoided and thoughtless tourists cause irreparable damage to beautiful natural features. Common sense is recommended.

The Park is almost barren of minerals. Petrified wood is found. There are some good nodules, and on Amethyst Mountain, the highest point of Speciman Ridge, amethyst crystals have been found—but, of course, no collecting.

Colored slides of the Park shown by Stanton Hill of Pasadena Junior College concluded Mr. Sanborn's talk.

Pauline A. Saylor
Covina, California.

Tucson Rock and Mineral Society

The Tucson Rock and Mineral Society was born in Tucson, Ariz., at 7:30 p.m. on Dec. 3, 1946.

The first meeting was attended by 28 people from many states and as a dash of the European Continent, a gentleman from Holland.

A temporary Advisory Board was appointed to draft by-laws and a constitution, etc.

May we extend best wishes and an invitation to the world—When in Tucson, Arizona, we will be most happy to welcome you!

Mrs. Margaret O. Gastelum,
1701 S. 6th Ave.,
Tucson, Ariz.

Queens Mineral Society

The regular monthly meeting of the Society was held on Thursday evening, Dec. 5, 1946, at the Church of the Resurrection, Richmond Hill, N. Y. Mr. Frank Lewis, a member of the Club, gave an excellent talk on thorium, its commercial significance, its occurrence and origin.

Election of officers was held and the following officers were elected:

Curt Segeler—President
Dr. Otto Trautz—Vice-President
Theodore Fredericks—Treasurer
William Stadler—Secretary

Mr. Segeler then appointed the Standing Committees.

Program Committee:
Dr. Otto Trautz—Chairman
Fred Poestkoke
Frank Lewis

Trip Committee:
Robert Shepard—Chairman
Arthur Rochunac
Bernard Zettl

Membership Committee:
Bernadette Marcin
Edward Marcin

Dinner Committee:
Ernest Maynard
Walter Helbig
Ruth Grotheer, Secretary

Newark Mineralogical Society field trip to Andover Iron Mines, Andover, N. J. Sunday, October 27, 1946. (Photo by Wesley Hayes).

Newark Mineralogical Society

At the December 1, 1946, meeting of the Newark Mineralogical Society held at the Newark Museum, Mr. P. G. Kellinghausen gave an interesting talk on "The Hidden Beauty of Minerals Revealed by Ultra-Violet Light." He used both the cold quartz and a hot quartz lamp for his demonstration, and showed the fluorescence of many fine specimens. After the talk other members who had brought specimens also showed them under the two ultra-violet sources.

Specimens of jasper from Vera Cruz, Pa., and of Ohio gypsum (variety selenite) were brought in by some of the members for distribution to any who wished them.

Photographs of the October 27th, 1946, outing at the Andover iron mines, Andover, N. J., were distributed to all present with the compliments of the president Mr. Wesley Hayes (who took the picture) and the chairman of the outing committee, Mr. Albert White.

Cincinnati Mineral Society

A meeting of the Cincinnati Mineral Society was held on Tuesday evening, Dec. 3, 1946. Officers for the 1947 term were elected as follows: President, Mr. F. P. Atkins Jr.; Vice-President, Mr. Ralph Dury; and Sec'y-Treas., Mr. Edgar H. Sarles. It was decided to continue to hold meetings at the Cincinnati Museum of Natural History throughout the winter season.

The topic of discussion for the evening was the mineral, calcite. All members brought interesting specimens from their collections to discuss and show to others. Mr. James Gibbs exhibited some especially interesting specimens which he had collected in Japan; other fine and unusual specimens were shown by Mr. Clements and Mr. Sarles.

Los Angeles Mineralogical Society

Mr. Norman Whitmore spoke on modern prospecting at the November meeting of the Los Angeles Mineralogical Society. Gone is the day when the old prospector set out into unknown regions with his burro, to be gone for months at a time and then return empty handed. Mr. Whitmore mentioned cases where prospectors spent years in the desert or mountains and labored incessantly; whereas the same could be accomplished at present in short order with the aid of modern science and instruments. He stated that nature has placed unmistakable sign posts all along the way to mark the treasures locked within her bosom. The prospector with his knowledge of geology and chemistry can in short order determine whether or not a new find is of value. Among the many instruments now employed can be mentioned the ultraviolet lamp, geiger counter, spectroscope field assay kit and last but not least the aeroplane and helicopter. Mr. Whitmore brought along a good display of ores, among them ores that by all indications should not contain gold but nevertheless did.

Arthur G. Weigel
Pub. Chm.

East Bay Mineral Society

Two meetings, a Christmas party, and a lapidary night were held by the Society during December, 1946. On Dec. 6th, a business meeting was held at the Society's headquarters, 422 Belvedere St., San Francisco, Calif., on Dec. 15th, the Christmas party was held; on Dec 18th a general meeting; and on Dec. 27th, the lapidary night.

Los Angeles Lapidary Society

The Los Angeles Lapidary Society held its annual Christmas dinner meeting at the Police Academy, Dec, 2, 1946. A special dinner with all the trimmings were enjoyed by members and many guests.

The high light of the evening was the Christmas grab-bag. Each member brought gifts corresponding to the number of his party. These gifts were deposited in a large box, then everyone marched by the box and selected the package of his choice. Many beautfiul pieces of jewelry, polished gems and unusual specimens were received .

The evening was rounded out with a good old-fashioned gab-fest, pictures of the 1945 exhibit at Exposition Park and the singing of Christmas carols.

On Sunday Dec. 1, a "house-warming field trip was taken to the new home of Louis and Katherine Goss on Mc Bride St., Los Angeles, Calif. Mr. Goss is head of the sales and display committee for the current year. While some members watched the lapidary demonstrations, others dug thro' the large pile of rocks out in the yard. Refreshments were served by the host and hostess, and Mr. Goss, whose birthday was on this date, received many remembrances of the happy day.

E. Grace Peters,
(pub. chairman).

Mineralogical Society of Southern Nevada

The "Rock Hounds" of Southern Nevada held their regular monthly meeting on Nov. 19th., with Mr. P. Mercer, President, presiding.

A great part of the meeting was spent in an absorbing discussion of the art of cutting and polishing specimens. It was also announced that five books, valuable for information on the geology of Nevada and mineral resources, had been donated the Society, by Mr. J. Carpenter, Director and Professor of Mining, at the Mackay School of Mines, Reno, Nevada.

At the conclusion of the meeting, color slides of previous field trips, desert flora, and Helldorado Parade were shown by Mr. D. McMillan. The pictures were all taken by Club members including, Mr. Gene Parks, Jr., Las Vegas, Mr. J. Redding, Henderson, Nevada, and J. Weston and D. McMillan of Boulder City, Nevada.

The Society enjoyed a very fruitful trip to Quo Vadis Mine on Sun. Nov. 23, 1946. Beautiful specimens of jasper as well as gold samples, amethyst crystals, and scolecites, were obtained. The club accepted an invitation from the Boulder City Camera Club to travel to White Hills in Arizona on Sat. Nov. 30th.

There were four names added to the list of members at the meeting, bringing the total membership to 65.

Florence McMillan
Sec-Treas.

San Fernando Valley Exhibition

San Fernando Valley Mineral and Gem Society, of California, closed its formal activities for 1946 with a truly impressive display at North Hollywood Recreation Center, Nov. 30th and Dec 1st. This, the third annual exhibition, was under the general chairmanship of Dan Hamer with various committees assisting.

Nearly a thousand visitors filed through the vast hall, where fifty members displayed in amazing variety the best of their mineral collections and of their handiwork in the fields of polishing, gem cutting and jewelry making. Both individual arrangement and total effect were most tasteful. An appropriate background was afforded by wall decorations consisting of Indian artifacts. This was supervised by Mrs. Glenn Craig, Society member, who has devoted many years to this additional hobby. The fluorescent minerals were effectively shown on the stage, behind drawn curtains, by Larry Higley. On view also were the Society's fine library and other equipment. About one hundred and thirty dollars were realized from the sale of grab bags, composed of mineral specimens and cutting material donated by the members, Kilian Bensusan in charge.

Faceting and polishing demonstrations were given by Chas. Clark and L. E. Waston, while Mrs. Geo. McPheeters and Mrs. L. M. McClure showed how gems are mounted in silver.

The majority of exhibitors, except dealer—members, competed for ribbons. Judges were Herbert Monlux, of Los Angeles Lapidary Society, Ernest Chapman and Jack Streeter, both of The Mineralogical Society of Southern California. Blue ribbons were awarded to George Parker, general display; Mrs. Geo. McPheeters, Jewelry—stones and mountings; J. B. Clarke, Jewelry mounted stones; Lawrence McKinley, cabochons; Geo. McPheeters, polished nodules; Geo. McPheeters, polished flats; Chas. Clark, faceted stones; Guy Bensusan Jr. Member, general displays; E. L. Newkirk, crystals, E. L. Newkirk, Minerals; J. B. Clarke, Novelties; Joe Iverson, Fluorescent Minerals; Mr. and Mrs. Alva Lynn, petrified wood. Nellie McPheeters, Pub. Chm.

Chicago Rocks and Minerals Society

The Chicago Rocks and Minerals Society met at the Sauganash Field House on December 14, 1946. A very interesting talk was given by Dr. Howland, head of the Geological Department of Northwestern University. His subject was "Semi-precious Stones" on which he gave us much information. He announced a question period after the lecture and the members kept him very busy for over an hour. It was a meeting which will long be remembered. The members brought an exhibit of polished cabochons, some of them made into jewelry.

George C. Anderson, Pres.

DR. MORRIS E. HUMPHREYS

JULY 21, 1908—OCTOBER 22, 1946

Dr. Morris E. Humphreys, president and founder of the Bellows Falls Rock and Mineral Club, passed away Tuesday morning, Oct. 22, 1946, at his home at 25 School St., Bellows Falls, Vt., as the result of a shock suffered the previous Sunday afternoon. Dr. Humphreys suffered the shock while he was engaged in his favorite pastime of hunting minerals—near South Newfane, Vt. The 38-year chiropractor never regained consciousness.

DR. M. E. HUMPHREYS

Dr. Humphreys was born in Rutland, Vt., on July 21, 1908, the son of Lilla and Orison Humphreys. He was graduated from the Rutland High School and from the Palmer School of Chiropractic in Davenport, Iowa, in 1930. He practiced in Rutland for a year before going to Bellows Falls, about 15 years ago.

Three years ago he was married to Marion Woodworth of Bellows Falls.

Besides his wife, he is survived by his father, Orison Humphreys, of Rutland; one son, Howard, from a former marriage; and two sisters, Mrs. Carroll Rich, of Rutland, and Mrs. J. Robert Shaffer, of Alexandria, Va.

In the death of Dr. Humphreys, the Bellows Falls Rock and Mineral Club has suffered a great loss a he was the leading spirit not only in building up the Club but especially on field trips in search of specimens. All Club members feel that it will be difficult to replace his untiring efforts and interest in all Club activities.

Dr. Humphreys was a member of the Rocks and Minerals Association whose sympathy is extended to his widow, son, and relatives.

Pomona Valley Mineral Club
Pomona, California

The December meeting was held in the Chemistry Building of Pomona College in Claremont. A full attendance of members and several guests enjoyed the talk given by Mr. Earl Knie on "TURQUOISE—The Birthstone of The Month."

Mr. Fred Kroger, President of the Club—and speaker of the evening, had on display a large collection of minerals and relics collected during the past summer—while on an extended trip through Nevada, Utah, Wyoming and Montana. The larger part of his vacation was spent collecting near his old home at Phillipsburg, Montana, where he was engaged in mining for many years.

His stories of his own experiences, as well as those of the early mining days at Granite and Virginia City, were both humorous and interesting. They dated back to the 1890's when millions of dollars in silver was taken from the fabulously rich ore.

Edythe M. Thompson
Pub. Chm.

World's Deepest Borehole in California

In the December, 1946, issue of *Rocks and Minerals* it was announced (page 870) that the Valley Well was California's deepest borehole, 16,278 feet deep. Mr. C. A. Noren, a member of the R&MA from Fresno, Calif., who sent in that note now informs us that the borehole has been extended to 16, 668 feet, making it the deepest borehole in the world. Drilling has been held up by a lost bit but will be continued and when finished he will let us know the total depth. The hole is being drilled by the Pacific Western Oil Corporation. It is located near Lost Hills, in Kern County.

HOLLAND ST. QUARRY

(Continued from page 11)

mineral. The twin law was verified some time later on crystals found at West Quincy.

The full description of these minerals was presented in a paper by the writer: "On Octahedrite, Brookite and Titanite from Somerville, Mass.," in Festschrift, Siebzigsten Geburtstage, von Harry Rosenbusch, Stuttgart, 1906, pages 311-321.

WITH OUR DEALERS

An 18 inch Alta diamond saw can be obtained from J. J. Jewelcraft, of Montrose, Calif.

N. H. Seward. of Melbourne, Australia, has an offering of beautiful boulder opal.

For lapidary supplies, custom sawing, and small specimen polishing, contact Roth's Agate Shop, of Waterloo, Iowa.

The Mission Mineral Mart, of San Diego, Calif., is again featuring San Diego gem material.

Note the new ad of Hyatt Lapidary Equipment Co., of San Diego, Calif., which features the "Streamliner" diamond sawing machine.

C. A. Holliday, of Battle Mountain, Nev., has in stock some nice limonite pseudos and smoky quartz crystals.

Some choice red moss agate can be obtained from Toupal Brothers, of San Jose, Calif.

A new advertiser is Stardust Gemhouse, of Blythe, Calif. Note the ad!

The H. E. Powell Co., of Little Rock, Ark., has an interesting announcement. Read it!

Gemol, a new soluble oil for sawing gem stones, can be obtained from the Geminlap Mart, of Milwaukee, Wisc.

A suite of those interesting crystal cavities (known as casts) from the zeolite region of New Jersey, may be obtained from John S. Albanese, of Newark, N. J.

Hermosa Gem & Mineral Shop, of Durango, Colo., can furnish good cutting material.

Harrison S. Cobb, of Boulder, Colo., has another offering of some interesting Colorado minerals.

Fred Roberts Jr., of Monterey Park, Calif., can supply a catalog of fine cabinet specimens and other material.

The Sartwell gem drill is an inexpensive drill for the amateur lapidary. For sale by the Long Beach Mineral & Lapidary Supply Co., of Long Beach, Calif.

A new advertiser is D. C. Henderson, of Detroit, Mich., who can furnish some fine cut stones of chlorastrolite and thomsonite.

Another new advertiser is Nevada Turquoise Mines, Inc., of Mina, Nev., who can furnish many Nevada gem minerals including, of course, turquoise.

More imported gem rough is featured by Lionel Day,. of New York City.

The Mineral Foundation, of Tucson, Ariz., can supply the very rare mineral, diaboleite.

Schortmann's Minerals, of Easthampton, Mass., extend an invitation to all collectors to attend their Sixth Annual Exhibition and Sale which will be held on Feb. 28th and March 1st, in the Lexington Hotel, New York City. They are also featuring a list of fine choice crystals.

Burminco, of Monrovia, Calif., presents another list of choice specimens.

Two interesting Mexican minerals are featured by Universal Minerals, of Los Angeles, Calif.

Mrs. B. F. Nonneman, of Salinas, Calif., can supply some beautiful specimens and gem material.

Stewart W. Hurlbut, of Salmon, Idaho, is featuring a mineral miscellany.

Have you a piece of "float" copper in your collection? Knowlton Minerals, of Joliet, Ill., can supply a specimen if you are interested.

Thompson's Studio, of Pomona, Calif., offers 4 interesting minerals this month. Look them up!

Hugh A. Ford, of New York City, presents his 8th list of fine minerals from an old collection.

Ward's, of Rochester, N. Y., have another list of selected mineral specimens for collectors.

An Oklahoma barite rose would look good in your collection. J. B. Lankford, of Oklahoma City, Okla., can supply it.

For interesting Idaho gem materials contact Lay-Art Gem Shop, of Boise, Idaho.

Chas. E. Hill, of Phoenix, Ariz., specializes in Arizona agates, jaspers, and petrified wood.

Exceptionally good books are listed in the ad of Jno. B. Litsey, of Dallas, Texas.

"To Serve you better!" is the policy of Grieger's, of Pasadena, Calif.

For this month the Western Trader, of Sacramento, Calif., offers some beautiful fluorescent onyx-like material from California.

Kelian E. Bensusan, of San Fernando, Calif., has had on display in the Van Nuys Public Library, Van Nuys, Calif., an all-Brazil collection of many choice specimens. The exhibit lasted 2 weeks and an interesting account of it appeared in the Nov. 25, 1946, issue of the *Van Nuys News*.

Still another new advertiser is Romart Gem & Mining Co., of Barstow, Calif.

Still another new advertiser is Border Queen Gems, of Caldwell, Kans., who feature fine cutting materials.

Herbert Sussbach, of New York City, can furnish used diamond cutting equipment and other items.

The Poly Rockhound Line, produced by Poly Products, of Pasadena, Calif., can be purchased from a number of dealers who handle lapidary equipment.

One of the most popular fluorescent lamps is the Mineralight, manufactured by Ultra-Violet Products, Inc., of Los Angeles, Calif. As the saying goes, "Every mineral dealer handles it."

Want any fine gem agate? E. B. Freeman, of Grand Junction, Colo., has it.

Again we announce a new advertiser. It is Mojave Desert Gem & Mineral Shop, of Yermo, Calif., whose proprietor is Earl W. Shaw.

Steel is so scarce, states Wilfred C. Eyles, of Bayfield, Colo., manufacturer of the famous "Streamliner" diamond saws, that he has not been able to obtain it in over 12 months. Read his ad in reference to it.

Mr. Eyles suffered a great loss on Dec. 3rd, 1946, when his beloved wife, Madge, passed away.

FLUORSPAR IN SPAIN

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 32)

In spite of a notable demand for Spanish fluorspar, production continues to be insignificant, the estimated output for the first half of 1946 being 4,205 metric tons, compared with 4,215 tons in the corresponding period of 1945. Small shipments of fluorspar have been made to the United States, Holland, Belgium, and Sweden.

The Rosalia I mine, 6 kilometers southeast of Fuenteovejuna, Cordoba Province, was examined recently by Evan Bennett, Minerals Attache, and samples analyzed showed that the ore was of metallurgical grade. The deposit was discovered about 1940 and produced for sale to the United States Commercial Company in 1944 and 1945. Production of shipping-grade ore has been as follows:

	Metric tons
1944	2,993
1945	1/2000
1946, first half	1/700

1/ Approximately

Present production is 100 to 200 tons a month.

The deposit consists of a well-defined vein 1½ to 2½ meters wide between walls of calcareous schist of Cambrian or Silurian age. The strike is east-west and the vein dips about 70° south. The vein contains quartz in stringers, considerable barite irregularly distributed, pockets of clay as fault gouge, and massive blocks of fluorspar. Small lenses of galena carrying up to 4 kilograms of silver a ton are found occasionally on the hangingwall contact.

The deposit has been worked by open-cut methods along 150 meters of the outcrop and up to 10 meters deep. A tunnel was driven at 30 meters, cross-cutting the vein. There is no noticeable change in the formation at the tunnel level. Operations are by hand mining. A portable compressor is on the property but is not in usable condition. The ore is transported from the mine to ore piles by wheelbarrows. Considerable clay and fines are contained in the ore as it comes from the mine. It is screened and hand-sorted, making a coarse shipping product. The fines are hauled in oxcarts to a stream 1 kilometer distant, where they are washed in boxes and the clay is removed.

The Rocks and Minerals Association

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Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

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Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy

GYPSUM IN BRITISH HONDURAS

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 35)

A report has been received by the British Colonial Secretary's Office from the Imperial Institute, London, of a test of a sample of gypsum from British Honduras. The sample consisted of 25 pounds of lumps of irregular shape, up to 6 inches in size, and quite variable in appearance. Some of the lumps appeared to consist of clean, colorless gypsum, and others contained bands and patches of a ferruginous clayey nature. The conclusions were as follows:

> The sample consists of rather impure gypsum from which a plaster could be prepared conforming to the chemical requirements of the British Standard Specification for gypsum plasters. The plaster will possess a slight pinkish color, and if a whiter material is required, hand-picking of the new gypsum appears to be the only simple method of effecting an improvement.

Another part of the report stated that the specific gravities of the pure material and the impurities appeared to be very similar, and it was found impossible to obtain a clean product by panning or washing in water. Therefore, the possibility of separating the impurities by mechanical means seemed remote.

The sample tested was obtained from the Western District of British Honduras near the town of Benque Viejo. No attempt to exploit the gypsum commercially has ever been made in the Colony, nor has a careful investigation into the extent of the beds been undertaken.

(Vice Consul Culver E. Gidden, Belize.)

MANGANESE IN PANAMA AND PHILIPPINES

(Bureau of Mines **Mineral Trade Notes**, Oct. 19, 1946, p. 15)

Panama.—The Mines and Fisheries Section of the Ministry of Agriculture and Commerce of the Panamanian Government announced recently that an American company would shortly begin operating a manganese deposit in the vicinity of Nombre de Dios in the Province of Colon. The ore is said to contain 47.15 to 54.89 percent manganese. (Foreign Service Clerk Fred A. Durling, Panama.)

Philippine Islands.—Output of manganese ore in the Philippine Islands during 1940 totaled 34,769 long tons, and during the first 10 months of 1941, 55,372 tons. According to S. Kondo, a Japanese geologist, the Busuanga mine was operated during Japanese occupation by the Nippon Kogyo Mining Co. Kondo reports that hand-selected ore from the mine was shipped to Japan but does not give the quantity. It is reported from other sources that 1,900 tons of newly mined ore and 840 tons from stock piles at the Bohol and Siquijor properties were shipped to Japan. Ore reserves, according to Kondo, are supposed to be about 20,000 tons. The Bohol mine in the southeastern part of Bohol Island and the Sikiyol mine in the northeastern part of Sikiyol Island were surveyed by the Nippon Kogyo Mining Co., but no mining was done. Original ore reserves are estimated at 500,000 tons. (First Secretary J. Bartlett Richards, Manila.)

Diamonds in Brazil

(Continued from page 28)

Bom Jesus was in disrepair and could not be traveled, another route was followed—Simplico Mendes-Sao Joao do Piaui-Sao Raimundo Nonato-Caracol-Nova Lapa-Bom Jesus, and continuing on horseback to Gilbues. The round trip required a month, most of which was consumed in travel. (American Clerk Katherine Kory, Rio de Janeiro.)

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